PREVALENCE OF GEKKONIDAE GECKOS INFESTED WITH ECTOPARASITIC MITES IN CILACAP

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Abstract. Topographically, Cilacap City is located at 108°4'30"- 109° 22' 30" East Longitude and 7°30'20" - 7°45' South latitude. Based on this geographical description, Cilacap City has an altitude of 6 m above sea level, and the implications of geographical conditions with temperature and humidity are thought to play an important role in determining the type of mites and the prevalence of Gekkonidae geckos infested by parasitic mites. The study aimed to determine the prevalence of Gekkonidae geckos infested with parasitic mites. The research method was a survey with a random sampling technique and the Gekkonidae geckos and parasitic mites obtained were identified in the Entomology-Parasitology laboratory. The results showed that the prevalence of Gekkonidae geckos infested with ectoparasitic mites in Cilacap reached 52.94%, consisting of 17.65% of Gekkonidae geckos infested by the parasitic mite *Hemidactylus frenatus*, 5.88% infested by each of *H. platyurus* and *Gehyra mutilata* and 23.53% by *H. garnotii*.

Keywords: prevalence, gekkonidae, geckos, ectoparasitic mite

A. Introduction

Topographically, Cilacap city is located at 108°4'30" - 109° 22' 30" East Longitude and 7°30'20" - 7°45' South latitude. Based on this geographical description, Cilacap city has an altitude of 6 m above sea level, and the implications of geographical conditions with temperature and humidity are thought to play an important role in determining the type of mites and the prevalence of Gekkonidae geckos infested by parasitic mites (Borroto-Paez & Reyes Pérez, 2022).

Geckos are classified into Phylum *Chordata*, Class *Reptilia*, Order *Squamata*, Suborder *Lacertilia*, and Family *Gekkonidae* (Paredes-León *et al*., 2013). The spread of geckos is relatively extensive and consequently increases the opportunity for various parasitic mites to meet and infect them. This increasing opportunity indicates the possibility of finding various species of parasitic mites and high prevalence of geckos infected by various species of parasitic mites (Fushida *et al*., 2020).Genus Geckobia mites infect almost all body surfaces of geckos, such as head, armpits, digiti, thighs, ears, and tail (Bertrand *et al*., 2013). The mites reside themselves in the geckos' body by gripping the geckos' claws and sticking their mouth into the geckos' body parts. Types of gecko's habitats and behaviors can determine the species and prevalence of Geckobia mites (Mockett, 2017).

Family Gekkonidae geckos are generally infected by the *Geckobia* ectoparasitic mites. Genus *Geckobia* including *G. hemidactili* known infecting *H. mabouia, G. carcinoides* geckos is an ectoparasite on *Gehyra oceanica* (Coates *et al*., 2017). The other studies showed that *G. clelandi, G. cosymbotyi* and *G. glebosum* mites were able to infect *C. platyurus* (Islands *et al*., 2004). These studies did not explain the infected group of geckos (house or tree geckos) by ectoparasitic mites or their prevalence.

According to (Prawasti *et al*., 2013), the prevalence of parasitic mites on *C. platyurus* and *H. frenatus* geckos in Indonesia is respectively 14.29% and 100%. These high prevalence values are due to the presence of geckos' lamellae, interspace between claws, and digiti tips which provide protection for the parasitic mites (Quiroz-Gutiérrez *et al*., 2015). In addition to protection, these parts are more frequently in contact with the substrate so that the chance of contact with the parasitic mites increases. The results of the reference search show that there is still very little research on parasitic mite species and their prevalence infesting geckos in Cilacap. The reference searching results have not revealed many species of parasitic mites and their infection prevalence on geckos, especially in Cilacap, Central Java.

The purpose of this study was to determine the species of parasitic mites infecting the geckos and their prevalence in Cilacap, Central Java. The results of this study are expected to provide a theoretical basis for controlling the geckos using the parasitic mites.

B. Methods

The research method is a survey with a random sampling technique. Samples of geckos were taken from Cilacap City, which has an altitude of 6 m above sea level.

The geckos obtained were preserved in 70% alcohol and stored separately based on their species. The geckos were then brought to the Entomology-Parasitology Laboratory, Faculty of Biology, University of Jenderal Soedirman, Purwokerto to identify the species of geckos and isolate the mites that infest the geckos using needle preparations.

Mites attached to each gecko, namely on the head, ears, armpits, body, thighs, tail, front fingers, and back fingers were taken using a prep needle. The number of mites at each attachment site was counted and stored separately in 70% alcohol based on the location of the mite attachment on each gecko.

Mites fixed in 70% alcohol were macerated (clarified) with lactophenol for 24 hours. The mites were placed on a glass slide and covered with lactophenol polyphenyl adhesive for mounting purposes. Subsequently, mites were identified to the species level.

Prevalence was determined by calculating the ratio of the number of individuals of each species of mite-infested geckos to the number of individuals of each species of geckos caught from each observation location.

C. Results And Discussion

The results of identifying geckos obtained in Cilacap are 4 species, each of which is *Hemidactylus frenatus*, *H. platyurus*, *H. garnotii* dan *Gehyra mutilata* (gambar 3.1; 3.2, 3.3; 3.4).

Figure 3.1. Hemidactylus frenatus

Figure 3.2. Hemidactylus platyurus

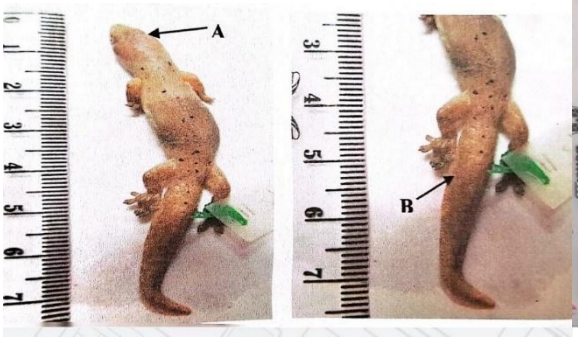

Figure 3.3. Hemidactylus garnotii

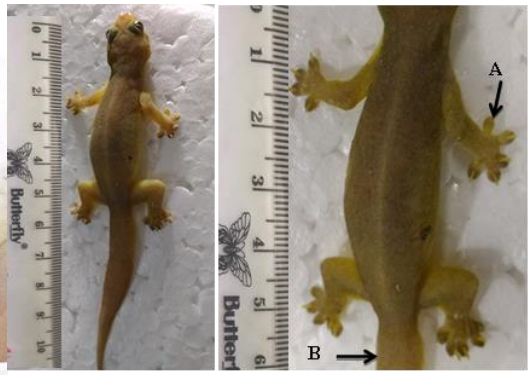

Figure 3.4. Gehyra mutilata

H. frenatus has a brownish-gray body on its back, no skin folds on either side of the body, long and wide fingers without membranes, and an elongated, round tail with six tubercle scales (Machado *et al*., 2019). *H. platyurus* has a body that is white to gray on the back and white on the abdomen. There are skin folds on both sides of the body, extending from the armpits to the thighs. The fingers are long and wide, and the tail is long and flat (Bertrand *et al.*, 2013). *H. garnotii* has a reddish-gray body on the back, with a slightly rounded head and rounded snout that is longer than the distance between the eyes and ear holes, and an elongated flat tail with serrated edges (Budianto & Basuki, 2021). *G. mutilata* has a robust body shape with a relatively large head (Fajfer, 2018).

The body parts of Geckkonidae geckos infected by ectoparasitic mites include the head, armpits, fingers, thighs, and tail. Of all the infected parts of the gecko's body, the fingers are the most affected. This is understandable, as the fingers are the first part to come into contact with the substrate when the gecko walks or crawls. The total number of geckos obtained in Cilacap was 17.

The results of the identification of parasitic mites infesting the 4 species of geckos showed that there were 5 species of parasitic mites, each of which is *Geckobia keegani, G. turkestana, G. simplex, G. gleadovania* and *G. diversipilis* (figure 3.5; 3.6; 3.7; 3.8; 3.9).

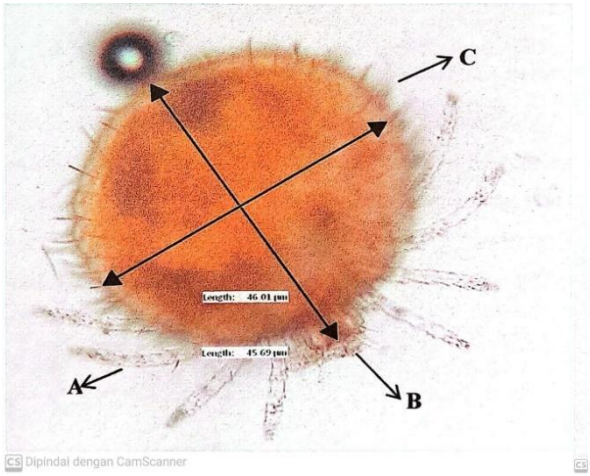

Figure 3.5. Geckobia keegani

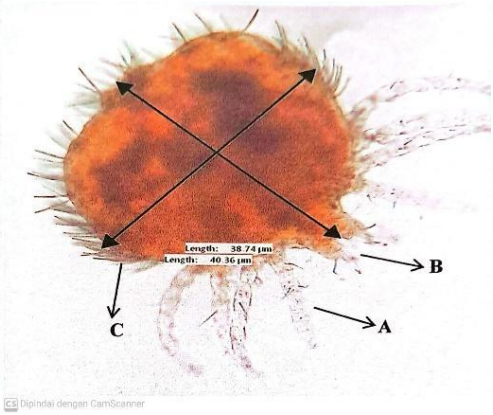

Figure 3.6. Geckobia turkestana

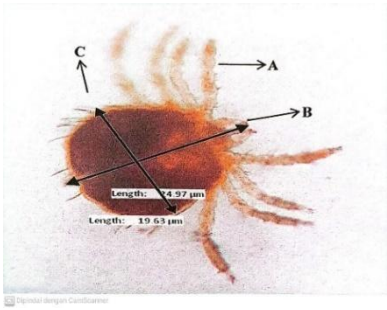

Figure 3.7. *Geckobia simplex*

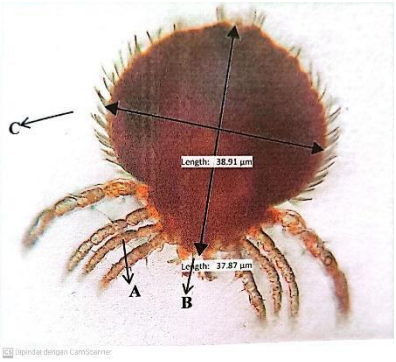

Figure 3.8. *Geckobia gleadovania*

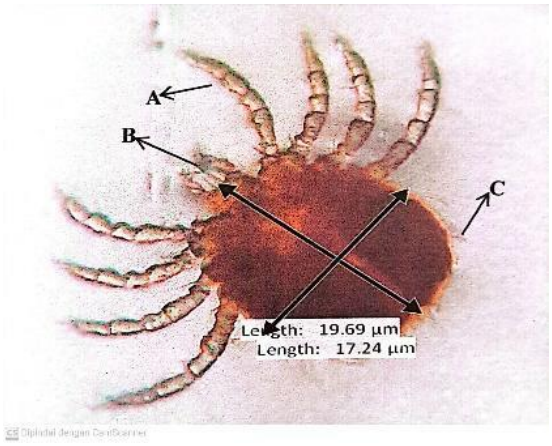

Figure 3.9. Geckobia diversipilis

The results of the prevalence analysis showed that the prevalence of geckos infested by parasitic mites in Cilacap reached 52.94% or 9 geckos infested by parasitic mites found out of 17 geckos. Based on the prevalence value of each type of geckos infested by parasitic mites, the prevalence can be seen in Table 3.1.

Table 3.1. Prevalence of geckos infested by parasitic mites in Cilacap (n = 17)

No	Species of geckos	Number of geckos infested with parasitic mites	Prevalence of geckos infested with parasitic mites (%)
1	*Hemidactylus frenatus*	3	17,65
2	*H. platyurus*	1	5,88
3	*H. garnotii*	4	23,53
4	*Gehyra mutilata*	1	5,88

Based on Table 3.1, *H. garnotii* and *H. frenatus* geckos exhibit a higher potential for ectoparasitic mite infestation compared to *H. platyurus* and *Gehyra mutilata*. This elevated infestation potential is attributed to the presence of skin folds on *H. frenatus*, which provide shelter for parasitic mites, protecting them from gecko movement and environmental conditions. Although *H. garnotii* has fewer skin folds, its larger scaly areas are believed to contribute to its higher prevalence compared to other geckos (Coates *et al.*, 2017).

D. Conclusion

The prevalence of Gekkonidae geckos infested with ectoparasitic mites in Cilacap reached 52.94%

E. Acknowledgement

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