

Prevalence and Infestation of Ectoparasite on Dabung Ducks in Bangkalan Madura

^{1*)}Ramadhiniyanti Putri Alif Prawasa, ²⁾Nunuk Dyah Retno Lastuti , ³⁾Dadik Raharjo ,
²⁾Poedji Hastutiek , ²⁾Endang Suprihati , ³⁾Dian Ayu Permatasari 

¹⁾ Student, Faculty of Veterinary Medicine, Universitas Airlangga

²⁾ Division of Veterinary Parasitology, Faculty of Veterinary Medicine, Universitas Airlangga

³⁾ Department of Veterinary Public Health, Faculty of Veterinary Medicine, Universitas Airlangga

*Corresponding author: ramadhiniyantiputri.a.p18.3002@gmail.com

Abstract

Identify the type of ectoparasite prevalence and infestation pattern of ectoparasite on Dabung duck in Bangkalan district Madura. This research conducted from February to April 2022 with sample of 55 heads and identified using the permanent mounting method without staining in Parasitology Laboratory of the Veterinary Parasitology Division, Faculty of Veterinary Medicine, Airlangga University, Surabaya. This research was survey and cross sectional studies. The type of ectoparasite that attacked 55 heads of Dabung duck in Geger subdistrict, Dabung village and Galis subdistrict, Pekaan Dajah village were *Menacanthus stramineus*, *Menopon gallinae*, *Lipeurus caponis* with a prevalence of 100%. The analysis results of infestation pattern of ectoparasite infestation on Dabung ducks used observed on the body regions of Dabung ducks in Geger subdistrict, Dabung village showed that *M. stramineus* ticks on chest, *M. gallinae* in head neck and *L. caponis* in wing. Burneh subdistrict, Burneh village found *M. stramineus* in abdomen, *M. gallinae* in head-neck, and *L. caponis* in wing. Galis subdistrict, Pakaan Dajah village showed that *M. stramineus* lice in head-neck, *L. caponis* in wing and *M. gallinae* in spine.

Keywords: Tick infestation, Dabung ducks, Ectoparasite pattern, Bangkalan.

Introduction

Dabung duck origins from Bangkalan District, distribution area of Dabung duck in Geger, Galis and Burneh sub-districts that able to survive and breed until now. Dabung ducks could adapt in Madura environment so they did not need a lot of water. Dabung ducks had a black striated brown fur color pattern, there was no white necklace on the neck in each population, beak color was dark yellow color at the end of beak there was a black spot, the color of feet was yellow (Affandi, 2018). According to data from the Livestock Service Office of Bangkalan District in 2020, showed that Bangkalan District has 82,381 ducks population.

In ducks breeding there were factors that influence success of Dabung duck breeders, for example feed, maintenance environment and disease. Pediculosis caused by presence of ectoparasites can cause losses for farmers (Putranto *et al.*, 2021). Transmission of ectoparasites is direct contact with affected animals. Ectoparasites are parasites that live on outer body surface of their host.

Types of lice that attack ducks are *Holomenopon fatemae*, *H. leucoxanthum* (62.44%), *H. maxbeibeieri*, *H. transvalence*, *Trinoton querquedulae* (0.58 %), *Anaticola*

crassicornis (12.57 %) found on wings, *Anatoecus dentatus* (18.3%) on edge of beak and head of ducks and *A. icterodes* (12.67%). *Menopon gallinae* is found on the ventral side, namely 37.13% and *Trinoton anserium* also included a tick that attacks ducks (Soulsby, 1986). *Gonicotes hologaster* lice could be found in ducks with a prevalence of 100%, the study is conducted on a sample of 20 ducks (Musa *et al.*, 2012). According to research conducted by Narayanaperumal *et al.*, (2016) in South Indian region, predilection of *Anatoecus dentatus* lice is found on the edges of beak and head of ducks. *Menopon gallinae* lice most commonly found on the ventral side, namely 37.13% and *Anaticola sp.*, most commonly found on wings, namely 59.09% (Fatimatussyahro, 2012).

Most common type of tick in poultry was *Dermanyssus gallinae* (7.03%) with predilection on tail, wings and abdomen. *Argas persicus* and *Argas robertsi* found on abdomen, under the wings. Most common mite species in poultry was *Knemidocoptes mutans* (1.82%) found on legs, *Knemidocoptes gallinae* and *Ornithonyssus bursa* found near cloaca which resulted in a decrease in domestic chicken productivity by more than 25% and in chicks less than one month old it could cause death (Kementan, 2014).



Prevalence of ectoparasites in ducks in Temanggung, Central Java (Lieviamanda and Susanti, 2021) at least 40% in Semarang and 100% in Magelang area. This happened because of different conditions of cage and environmental parameters. According to research by Rama *et al.*, (2017) in Kramat village, Bangkalan District, layer duck cages mixed with other livestock cages such as chickens and cows so that prevalence of *Menacanthus stramineus* lice 25% and *Lipeurus caponis* prevalence is 17.5% of 31 layer ducks.

Generally, Dabung ducks in Bangkalan are cultivated intensively in cages from three people's farms, Dabung duck cages, there are differences in maintenance environment, in Dabung village, Geger sub-district, which is in hill area so it has a cold atmosphere, Pakaan Dajah Village, Galis sub-district, duck cage mixed with other livestock, and Burneh sub-district Burneh duck cage has poor sanitation. High temperatures in environment and cages can trigger presence of ectoparasites (Samwobo *et al.*, 2017). This condition causes ectoparasites to develop on surface of duck's body. Rain with high humidity will increase population of lice and on dry condition lice moving towards shaft by incubating eggs (Naz *et al.*, 2016). According to Central Bureau of Statistics of Bangkalan District (2021) regional humidity of sub-district varies with average rainfall, in Geger sub-district 140.83 mm, Galis sub-district 13.07 mm and Burneh sub-district 135.11 mm.

Dabung duck farm is experienced some problem by farmers, most of problem are ectoparasites due to poor cage sanitation (Mungube *et al.*, 2006). Prevalence of ectoparasites affects productivity of livestock that attacks Dabung ducks is a big problem in smallholder farms. Ectoparasites in poultry causes weight loss, reduces egg production significantly and causes death in young livestock (Alemu, 2003).

Efforts to prevent and control diseases caused by ectoparasites are very important to avoid greater losses. One of these efforts is provision of powder or spray on litter (Hastutiek *et al.*, 2014). However, it is successful if know spread of ectoparasites that infest and their predilection in these animals so that drug therapy given is right on target.

Based on this description, because there are no reports on ectoparasites in Dabung ducks in Bangkalan District yet, a study needed to determine prevalence and pattern of ectoparasite infestation in Dabung ducks in several sub-districts of Bangkalan District Madura. Results

found are expected to be able to provide information on disease data and efforts to prevent and control ectoparasites in all part of duck body can be made.

Methods

Material is Lice, ticks and mites on Dabung ducks found in Dabung village, Geger sub-district, Burneh village, Burneh sub-district and Pakaan Dajah village, Galis sub-district, Bangkalan district, cotton buds moistened with 70% alcohol, 10% KOH, aquadest, 30% alcohol, 50%, 70 %, 95%, 96%, xylol, and canada balsam. Equipment used are a thermometer, 20 cc sample pot, tweezers, petri dish, object glass, cover glass, label paper, tissue, camera, microscope, optic lab, cotton buds and stationery.

Samples used in this research are lice, ticks and mites from 55 Dabung ducks. Dabung duck samples taken were male and female. Samples taken by simple random sampling to determine number of samples based on Slovin formula (Umar, 2002). Calculation result using Slovin formula obtained a sample of 55 samples with a total population of 123 Dabung ducks in several districts of Bangkalan District.

$$n = N / (1 + Ne^2)$$

n = sample size

N = population size

e = percent leeway inaccuracy error tolerance limit used is 10% (Umar, 2002).

Samples were taken from local farms of Dabung village, Geger sub-district 18 heads, Burneh village, Burneh sub-district 18 heads and Pakaan Dajah village, Galis sub-district, Bangkalan district 19 heads. Regions for taking ectoparasites were the head-neck, back, abdomen, wings, and chest of Dabung ducks. Specimens of lice, ticks and mites taken by visual examination using cotton buds moistened with 70% alcohol with tweezers, then put into a sample pot that had been given 70% alcohol to preserved and labeled and then brought to laboratory.

Permanent mounting without staining method, ectoparasites were killed with 70% alcohol first and cleared with 10% KOH at a height of 1/3 tube for 24 hours. When pigment is thin, continue to drying stage uses alcohol with an increasing concentration of 30%. 50%, 70%, 95%, 96%. Soak in xylol for 5 minutes. In mounting stage, to attach fleas and ticks to the object glass using a sufficient amount of canada

balsam then covered with a cover glass. Identification using a microscope with a magnification of 40x-100x (Hastutiek *et al.*, 2015) and a label containing species/genus name, location and date of collection, and collector's name.

Mites scraping method, Dabung ducks with lesions, wet cotton buds using distilled water and smeared on the lesions. Put cotton buds in the 10% KOH solution for up to 5 minutes. Solution dripped sufficiently on object glass and covered with a cover glass. Glue the edges of cover glass using nail polish. Then identify using a microscope with a magnification of 100x-400x and label it (Hastutiek *et al.*, 2015).

Data obtained presented descriptively. Results obtained in form of positive or negative samples infected with ectoparasites based on type, prevalence, and pattern of ectoparasite infestations in Bangkalan district then analyzed using a correspondence test using the SPSS for Windows Real Program 26.

A positive sample is calculated its prevalence rate with this formula:

$$\text{Prevalence} = \frac{\text{Total infected samples}}{\text{Total samples}} \times 100\%$$

Results and Discussion

Results of identification of ectoparasites infested Dabung ducks in several sub-districts of Bangkalan district found lice with species are *Menacanthus stramineus*, *Menopon gallinae*, *Lipeurus caponis*, while ticks and mites not infested on Dabung ducks.

M. stramineus was a louse from order Phthiraptera, family Menoponidae. Characteristic of *M. stramineus* were yellow, flat abdomen, elongated and broadly rounded posteriorly with a row of two rows of dorsal bristle on each abdominal segment.

M. gallinae was a louse from order Phthiraptera, its characteristic were triangular head shape and wide, small palps have two tarsal nails and on thorax and abdomen segments have only one row of dorsal hair.

L. caponis was a louse from order Phthiraptera, it has characteristic a long and narrow body, small capitulum, frontal part of capitulum protrudes after antenna, antenna is composed of five segments, does not have a maxillary palpus, filiform antennae on the side of capitulum and has longest hind legs.

Tabel 1. Results of identification of ectoparasites infesting Dabung ducks in Bangkalan district.

Location	Total Sample	Positive Sample	Ectoparasite species	Ectoparasites (%)	Size of ectoparasite species	
					Length	Width
Geger sub-district, Dabung village	18	18	<i>Menacanthus stramineus</i>	9 (20.9%)	2271.5 µm	934.44 µm
			<i>Menopon gallinae</i>	10 (23.3%)	4557.8 µm	1001.1 µm
			<i>Lipeurus caponis</i>	24 (55.8%)	1804.2 µm	799.18 µm
Burneh sub-district, Burneh village	18	18	<i>Menacanthus stramineus</i>	7 (25.0%)	2875.3 µm	1278.8 µm
			<i>Menopon gallinae</i>	7 (25.0%)	4509.4 µm	1148.19 µm
			<i>Lipeurus caponis</i>	14 (50.0%)	3604 µm	1412.93 µm
Galis sub-district, Pekaan Dajah village	19	19	<i>Menacanthus stramineus</i>	8 (27.6%)	2919.5 µm	1217.01 µm
			<i>Menopon gallinae</i>	10 (34.5%)	5151.1 µm	1972.18 µm
			<i>Lipeurus caponis</i>	11 (37.9%)	10814.4 µm	2766.9 µm

Table 2. Prevalence of ectoparasites infesting Dabung ducks in Bangkalan district Madura

Location	Total Sample	Ectoparasite species	positive sample	Prevalence (%)	Infection type	
Geger sub-district, Dabung village	18	<i>M. gallinae</i>	2	11.1	one	
		<i>L. caponis</i>	4	22.2		
		<i>M. stramineus</i>	5	27.8	two	
		<i>L. caponis</i>				
		<i>M. gallinae</i>	4	22.2		
		<i>L. caponis</i>				
		<i>M. gallinae</i>	1	5.6		
		<i>M. stramineus</i>				
		<i>M. stramineus</i>				
<i>L. caponis</i>	2	11.1	More than two			
<i>M. gallinae</i>						
Total	18	-	18	100	-	
Burneh sub-district, Burneh village	18	<i>M. stramineus</i>	2	11.1	one	
		<i>M. gallinae</i>	1	5.6		
		<i>L. caponis</i>	8	44.4		
		<i>M. gallinae</i>	2	11.1	two	
		<i>M. stramineus</i>				
		<i>M. gallinae</i>	3	16.7		
		<i>L. caponis</i>				
		<i>M. stramineus</i>				
		<i>M. stramineus</i>	2	11.1		
<i>L. caponis</i>						
Total	18	-	18	100		-
Galis sub-district Pakaan Dajah village	19	<i>M. stramineus</i>	2	10.5		one
		<i>M. gallinae</i>	4	21.05		
		<i>L. caponis</i>	4	21.05		
		<i>M. gallinae</i>	2	10.5	two	
		<i>M. stramineus</i>				
		<i>M. gallinae</i>	3	15.7		
		<i>L. caponis</i>				
		<i>M. stramineus</i>				
		<i>L. caponis</i>	3	15.7		
<i>M. stramineus</i>						
<i>L. caponis</i>	1	5.6	More than two			
<i>M. gallinae</i>						
Total	19	-	19	100		

Highest ectoparasite infestation from three sub-districts occurred in Dabung village, Geger sub-district, there were 43 lice that infested 18 Dabung ducks with 3 species, *M.*

stramineus, *M. gallinae* and *L. caponis*. Lice infestations in Dabung ducks could be seen in Table 3.

Table 3. Ectoparasite infestation in Dabung ducks in Bangkalan District Madura

Location	Ectoparasites	Regions				
		Head- Neck	Back	Wing	Abdomen	Chest
Dabung village, Geger sub-district	<i>M. stramineus</i>	3	-	-	1	1
	<i>M. gallinae</i>	7	-	-	2	1
	<i>L. caponis</i>	8	-	10	4	6
Burneh village, Burneh sub- district	<i>M. stramineus</i>	4	-	1	2	-
	<i>M. gallinae</i>	3	-	3	1	-
	<i>L. caponis</i>	-	-	13	-	1
Pakaan Dajah village, Galis sub-district	<i>M. stramineus</i>	8				
	<i>M. gallinae</i>	5	2	2	1	-
	<i>L. caponis</i>	-	-	8	3	-

Analysis result of lice infestation pattern in Dabung ducks using statistical correspondence analysis showed that in Bangkalan District there was no significant difference in pattern of infestation between Dabung duck cages in Dabung village, Geger sub-district, Burneh village, Burneh sub-district and Pakaan Dajah village, Galis sub-district, found 3 types of lice, *M. stramineus*, *M. gallinae*, *L. caponis*.

Results of ectoparasites closeness and regions in Dabung ducks in Dabung village, Geger sub-district in Figure 1.

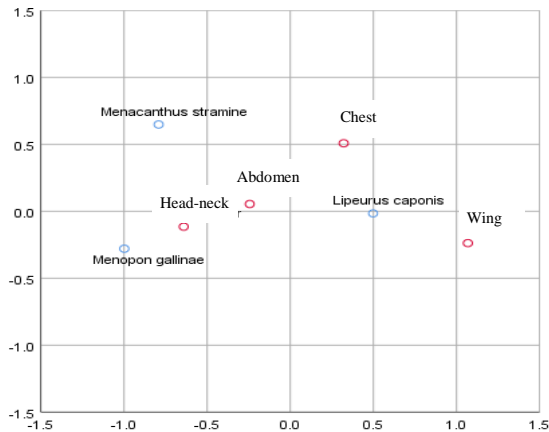


Figure 1. Relationship between regions and types of lice that infest Dabung ducks in Dabung village, Geger sub-district.

Dabung village, Geger sub-district, showed results of infestation pattern that *M. stramineus* had closer ties to chest region compared to *L. caponis* and *M. gallinae*. *M. gallinae* has closer ties to head-neck region compared to *M. stramineus* and *L. caponis*. *L. caponis* has a stronger attachment to the wing region than *M. stramineus* and *M. gallinae*.

Results of ectoparasites closeness and regions in Dabung ducks in Burneh village, Burneh sub-district in Figure 2.

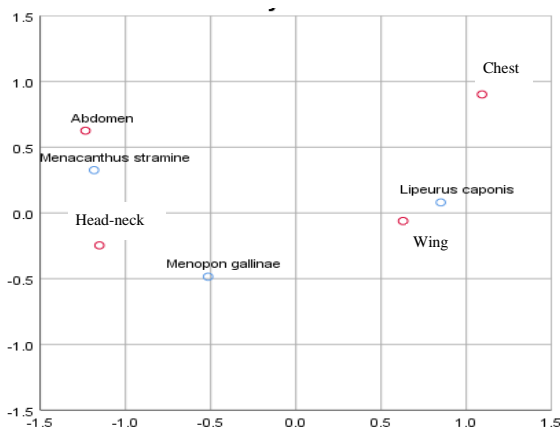


Figure 2. Relationship between regions and types of lice that infest Dabung ducks in Burneh village, Burneh sub-district.

Burneh village, Burneh sub-district, found that *M. stramineus* louse more closely related to abdominal region compared to *M. gallinae* and *L. caponis*. *M. gallinae* louse has closer head-neck region than *L. caponis* and *M. stramineus*. *L. caponis* is a louse that has strong affinity with wing region because it has distinctive predilection for wing region compared to *M. stramineus* and *L. caponis*.

Results of ectoparasites closeness and regions in Dabung ducks in Pakaan Dajah village, Galis sub-district in Figure 3.

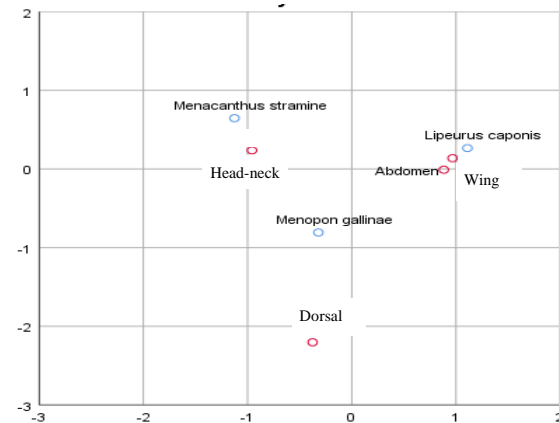


Figure 3. Relationship between regions and types of lice that infest Dabung ducks in Pakaan Dajah village, Galis sub-district.

Pakaan Dajah village, Galis sub-district, showed results of infestation pattern that *M. stramineus* had closer head-neck region compared to *M. gallinae* and *L. caponis*. *M. gallinae* louse were closer to dorsal region compared to *L. caponis* and *M. stramineus* lice. *L. caponis* louse is closer to wing region than *M. stramineus* and *M. gallinae*.

Conclusion

Based on results of study of 55 Dabung ducks in Bangkalan District Madura, species of ectoparasites that infested Dabung ducks in Dabung village, Geger sub-district, Burneh village, Burneh sub-district and Pakaan Dajah village, Galis sub-district infested with same lice species, *M. stramineus*, *M. gallinae* and *L. caponis* with a prevalence of 100% from 55 samples of Dabung ducks. Pattern of ectoparasite infestation in body region of Dabung ducks in Dabung village, Geger sub-district showed *M. stramineus* lice in chest region, *M. gallinae* in the head-neck region and *L. caponis* in wing region. Burneh village, Burneh sub-district, found *M. stramineus* lice in abdominal region, *M. gallinae* in head-neck region, and *L. caponis* in wing region. Pakaan Dajah village, Galis sub-district, showed *M. stramineus* lice in head-neck region,

L. caponis in wing region, and *M. gallinae* in dorsal region.

Acknowledgment

The author thanks the Dean of the Faculty of Veterinary Medicine, Universitas Airlangga Prof. Dr. Mirni Lamid, drh., MP. Veterinarians and staff of the Bangkalan District livestock service office as well as Dabung duck breeders in Geger sub-district Dabung village, Burneh sub-district Burneh village and Galis sub-district Peka-an Dajah village for all the assistance that has been given in the research sampling process.

References

- Affandi, A.N. (2018). Keragaman fenotip pada itik dabung dan itik patemon periode starter di Kabupaten Bangkalan, Madura [Skripsi]. Fakultas Peternakan. Universitas Brawijaya Malang. (Abstr):7
- Alemu, Y. (2003). Village chicken production systems in Ethiopia: use patterns and performance evaluation and chicken products and socio-economic functions of chicken livestock research for rural development, <http://www.cipav.org.co/irrd/irrd15/1>, retrieved date 17 March, 2015.
- Badan Pusat Statistik Kabupaten Bangkalan. (2021). Peta statistik Kabupaten Bnagakalan. Dalam Angka.
- Fatimatussyahro. (2012). Prevalensi Ektoparasit pada Itik Jawa (*Anas javanica*) di Desa Glagahwero Kecamatan Kalisat Kabupaten Jember [Skripsi]. Fakultas Matematika dan Ilmu Pengetahuan Alam. Universitas Jember. (Abstr.): 7
- Hastutiek, P., Sasmita, R., Sunarso, A., & Yunus, M. (2014). Buku Ajar Ilmu Penyakit Arthropoda Veteriner. Fakultas Kedokteran Hewan, Universitas Airlangga, 1-48.
- KEMENTAN. Kementerian Pertanian. (2014). Manual Penyakit Unggas. Direktorat Kesehatan Hewan Kementerian Pertanian, 202-206.
- Lieviamanda, M., & Susanti, R. (2021). Prevalensi ektoparasit dan endoparasit itik petelur yang dipelihara pada peternakan intensif di Jawa Tengah: Prosiding Semnas Biologi ke-9 Tahun 2021 FMIPA Universitas Negeri Semarang.
- Musa, S., T. and Khanum, R.H. (2012). Prevalence and Intensity of Parasites in Domestic Duck. Dhaka Univ. J. Biol. Sci., 21(2): 197-199.
- Mungube, E.O.S.M., Bauni, L., Muhammad, E.W., Okwack, J.M., Nginyi & Mutuoki, T.K. (2006). A survey of the constraints affecting the productivity of the local scavenging chicken in the Kionyweni cluster, Machakos District. Kari Katumani Annual Report.
- Narayanaperumal, J., Ahamad, D.B., & Jayaraman, S. (2016). First Report of *Anatoecus dentatus* in Domestic Duck (*Anas platyrhynchos domesticus*, Linnaeus, 1978) from Southern India. Parasite Epidemiology and Control, 1:131-135.
- Naz, S., Shaikh, N. F., & Birmani, A. (2016). Incidence of Chewing Lice (Phthiraptera: Insecta) on Common Mallard, *Anas Platyrhonchos* (Anatidae: Anseriformes: Aves) in Karachi Region, Pakistan. Middle East Journal of Scientific Research, 24 (7): 2260- 2265.
- Putranto, H.D., Meriana, M., Brata, B. & Nurmeiliasari, N., (2021). Kelimpahan Relatif Ektoparasit pada Inang Ayam Buras Lokal. Buletin Peternakan Tropis, 2(1): 1-8.
- Rama, K.A., Hastutiek, P., Widodo, O.S., Suprihati, E., Sunarso, A., & Soeharsono. (2017). Pola Infestasi Kutu Pada Itik Petelur di Desa Kramat Kecamatan Bangkalan Kabupaten Bangkalan. Journal of Parasite Science, 1(2): 51-54.
- Samwobo, S.O., Innocent, N.P., Oyatogun, I., Surakat, O.A., & Mogaji, H. (2017). Status of helminths in birds kept in zoological park, Abeokuta, Nigeria. Journal of Entomology and Zoology Studies, 5(6): 390-394.
- Soulsby, E.J.L. (1986). Helminths, Arthropods and Protozoa of Domesticated Animals. 7th ed. Bailliere Tindall. W.B. Saunders. England. 366-367.
- Umar, H. (2002). Metode Penelitian Dalam Aplikasi Pemasaran. PT Gramedia Pustaka Utama. Jakarta. Hal. 284.