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Identification, Prevalence and Infestation Patterns of Ectoparasite in Culled Laying MP Hybrid Ducks in Mojosari, Mojokerto

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ABSTRACT

The purpose of this study was to identify ectoparasites and to determine the prevalence and infestation patterns of ectoparasites that attack the MP hybrid type culled ducks in Gedang Hamlet, Modopuro Village, Mojosari Sub-District, Mojokerto Regency. This study used 100 samples of culled MP hybrid laying ducks. The obtained ectoparasites were identified at the Division of Veterinary Parasitology labaroratory, Faculty of Veterinary Medicine, Universitas Airlangga, Surabaya, using the permanent mounting method without staining and viewed using a microscope with 40-100x magnification. This study found 71 samples positively infested with ectoparasites out of 100 samples of culled MP hybrid ducks examined with (prevalence of 71%). The types of ectoparasites found in this study were *Menacanthus stramineus* (25%), *Menopon gallinae* (9%), and *Anaticola crassicornis* (59%). Correspondence analysis test was conducted to show the pattern of infestation of the ectoparasites. The head-neck region was infested by *M. stramineus* and *M. gallinae*, while the back, wings, abdomen and tail regions were infested by *A. crassicornis*. *A. crassicornis* mostly attacked the MP hybrid type of culled laying ducks on the wings, compared to the back, abdomen and tail. *A. crassicornis* is an ectoparasite that is typical for the wing region, while *M. gallinae* and *M. stramineus* are ectoparasites that are typical for the head-neck region.

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INTRODUCTION

Breeders in Indonesia are currently starting to develop hybrid duck breeding. Hybrid ducks are ducks resulting from crossing two or more different types of ducks (Supriyanto and Sitanggang, 2017), which are ideally produced from two parents who have pure blood, so that the resulting seeds are maintained in quality. Breeders in Modopuro Village, Mojosari Sub-District, Mojokerto Regency cultivate hybrid ducks from the results of a cross between female Mojosari ducks and male Peking ducks which produced MP hybrid ducks (Mojosari - Peking) (Rochmawati, 2018).

Modopuro Village, Mojosari Sub-District, Mojokerto Regency is known as duck village because the livelihood of the people around the village is mostly raising ducks. The increase in consumption of duck meat that occurs continuously, causes laying ducks that are no longer productive to be used as broiler ducks or used as ducks. This is done because the economic value of the duck can no longer be expected. One of the causes of unproductive laying hybrid ducks or ducklings is due to the presence of ectoparasites. Ectoparasites are parasites that live on the outer surface of the host's body or inside parts of the skin. Ectoparasites

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can affect duck health directly by causing irritation, tissue damage, blood loss, toxicosis, allergies and dermatitis which can cause the quality and quantity of meat and eggs to decrease (Tamiru *et al*., 2014; Ikpeze *et al*., 2017). The spread of ectoparasites is influenced by several factors, namely the host's body temperature, environmental conditions and the structure and number of feathers in the host. Ectoparasites can breed well in dirty cage conditions and poor sanitation

MATERIALS AND METHODS

The type of research used is non-experimental research by surveys. Sampling is carried out by purposive sampling with the unproductive MP hybrid laying ducks that. The samples used in this study were 100 MP hybrid laying ducks taken from Gedang Hamlet, Modopuro Village, Mojosari Sub-District, Mojokerto Regency. The research method used is permanent mounting without staining to identify ectoparasites that infest laying ducks of MP hybrid type. The tools and materials used are KOH 10%, cotton, alcohol (30%, 50%, 70%, 95%, and 96%), xylol, and canada balsam, Nikon Eclipse E100 light microscope, Olympus SZ51 stereo microscope, object glass, cover glass, petri dish, tweezers, blade, specimen pot, optilab, label paper, tissue, digital camera and stationery.

The data obtained is then presented descriptively. Knowing the type of ectoparasite that infests laying ducks of MP hybrid types and carried out statistical analysis of *Correspondence* to determine the pattern of ectoparasite infestation in laying ducks of MP hybrid types. Statistical analysis is carried out using the SPSS (*Statistical Product and Service Solution*) program.

RESULTS AND DISCUSSION

The results of the identification of ectoparasites that infested laying ducks of MP hybrid types in Gedang Hamlet, Modopuro Village, Mojosari Sub-District, Mojokerto Regency were *Anaticola crassicornis* 59%, *M. stramineus* 25%, and *M. gallinae* 9% (Table 2). Ectoparasite identification is done by examining body size using a microscope equipped with a raster image optilab tool and identifying characteristics using ectoparasite identification keys Soulsby (1986), and Wall and Shearer (2001).

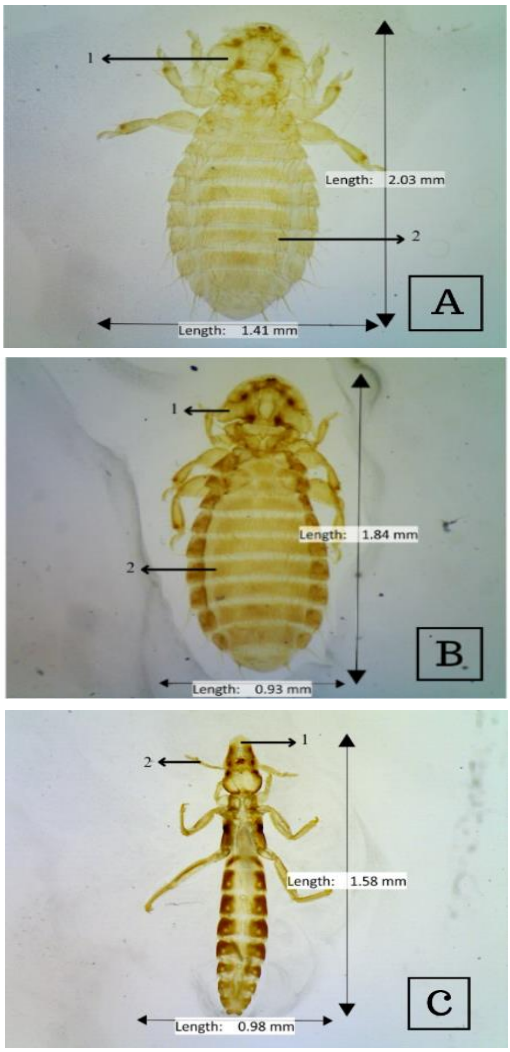

Figure 1. Types of ectoparasites. **A**. *M. stramineus*, **B**. *M. gallinae*, **C**. *A. crassicornis*

Menacanthus stramineus, one of the ticks that infest laying ducks of the MP hybrid type, has a characteristic yellow body, the head of *M. stramineus* is triangular and has two rows of dorsal bristle on the abdomen (Figure 1A). *Menopon gallinae* has a characteristic pale yellow body, has a single row of dorsal bristle on the abdominal segment, has a flattened and wide triangular head shape (Figure 1B). *Anaticola crassicornis* has a characteristic body shape long and narrow, flat body, has no wings. It has a wide and more blunt capitulum shape, located on the right and left sides of the head. heteromorphic antenna (Figure 1C).

Table 1. Identification of ectoparasite infestation culled MP hybrid laying ducks

Sample	Infestations			Types of ectoparasites		
	Types of infection	Number of ducks	(%)	Ectoparasites	Number of ducks	(%)
Positive	Single	49/71	69	*M. stramineus*	9/71	12.7
				M. gallinae	3/71	4.2
				A. crassicornis	37/71	52.1
	Mixture	22/71	31	*A. crassicornis* and *M. stramineus*	16/71	22.5
				A. crassicornis and *M. gallinae*	6/71	8.5
Total		**71**	**100**		**100**	**100**

The result of this study showed that 71 heads from 100 samples of MP Hybrid laying ducks were positive infested with ectoparasites. The calculation of prevalence obtained in the sample results is 71% which is calculated using the prevalence formula according to Sutrisnawati (2001) which is included in the category of 'common' infestations according to Williams and Williams (1996). *Anaticola crassicornis* become the most common with 59% prevalence. The presence of ectoparasites that infest MP Hybrid laying ducks in Gedang Hamlet, Modopuro Village can be caused by dirty cage conditions due to the large accumulation of duck manure that is rarely cleaned, damp cages, and also poor cage sanitation can be the cause of the growth and development of ectoparasites (Bahtiar *et al*., 2014). The condition of the cage that does not get sun exposure due to the large number of bamboo trees around the cage also causes damp cage conditions that support the development of ectoparasites well (Sholihah *et al*., 2021). With dirty and damp cage conditions, it can affect the susceptibility of ectoparasites in laying ducks of the MP Hybrid type because they are grouped in the same cage so that they have the same chance of being infested with ectoparasites. Ectoparasite infestation can cause ducks to experience stress, decreased appetite, decreased body weight, and decreased duck productivity causing the duck to be abandoned (Jannah *et al*., 2011).

Table 2. Prevalence of ectoparasites infesting MP hybrid type culled laying ducks

Species	Infested Samples	(%)	Information
Anaticola crassicornis	59 heads	59	Very frequent infestations
Menacanthus stramines	25 heads	25	Frequent Infestations
Menopon gallinae	9 heads	9	Rare Infestations

The pattern of ectoparasite infestation in laying ducks of the MP Hybrid type has a close relationship between predilection and the type of tick (Figure 2). In this study in the head-neck region of ectoparasites that infested laying ducks, the MP hybrid types were *M. stramineus* and *M. gallinae.* Meanwhile, in the region of wings, back, abdomen, and tail ectoparasites that infest is the type of *A. crassicornis.* The pattern of ectoparasite infestation in this study was obtained from the results of the Correspondence analysis test which showed a close relationship between the wing region and the ectoparasite type *A. crassicornis*, while the head-neck region showed a close relationship with ectoparasites type *M. stramineus*.

Many M. *stramineus* are found in the head-neck region in accordance with what Noble and Noble (1998) said (in Rama 2017) that *M. stramineus* ticks with a wide body shape, capitulum and wide mandible have a predilection in the head-neck region. *M. stramineus* is mostly found in the head-neck region because this tick prefers places with relatively little fur such as on the head and neck (Selfiannisa *et al*., 2018). Likewise, M. *gallinae* is found in the head-neck region because this tick has a wide body morphology and strong mandibles, so that this tick can adapt to body regions that move a lot such as the head-neck (Rama *et al.*, 2017).

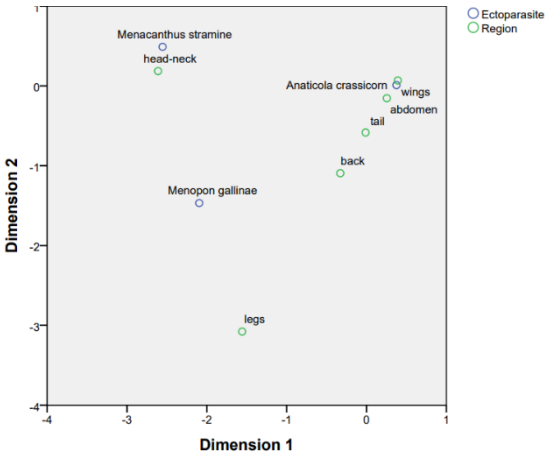

Figure 2. The relationship between region and types of ectoparasites infestation of MP hybrid type culled laying duck

The number of *A. crassicornis is* found in the wing region because the feathers in the wing region have a thicker and denser feather structure, making it difficult for ducks to peck at the wings, making it easier for ticks to live and resulting in high populations (Putranto *et al*., 2021). The presence of *A. crassicornis* in other regions is related to the habit of ducks flapping their wings. Have instincts that can help to determine the place of life or move to other regions based on the availability of food and the environment that allows ticks to live and reproduce optimally without being disturbed by the physical response of their host (Noble and Noble, 1982). *A. crassicornis* is commonly called duck lice because ducks are specific hosts of this type of tick (Dik and Uslu, 2012).

CONCLUSION

Ectoparasite species that infest laying ducks are *A. crassicornis*, *M. stramineus*, and *M. gallinae*. The prevalence of ectoparasites in laying ducks of the MP Hybrid type is 71%. Single infections were *M. stramineus* (12.7%), *M. gallinae* (4.2%), and *A. crassicornis* (52.1%). Mixed infections of *M. stramineus* and *A. crassicornis* (22.5%), *M. gallinae* and *A. crassicornis* (8.5%) (Table 1). and pattern of ectoparasite infestation in the body region of laying ducks of the MP Hybrid type shows that ectoparasites with *A. crassicornis* species are most commonly found in the wing region and least in the dorsal region. The species *M. stramineus* and *M. gallinae* are most commonly found in the head-neck region.

REFERENCES

Bahtiar, D.H., Susanti, R,. and Rahayuningsih M. (2014) 'Diversity Of Ectoparasites Of The Crooked-Billed Bird Family Psittacidae In Semarang Wildlife Park'. *Unnes Jurnal Life Sci*. 3(2), pp. 139-147.

Dik, B. and U. Uslu. (2012) 'Studies on Chewing Lice (Phtiraptera) Species Found on Some Duck (Anseriformes: Anatidae) Species at Lake Aksehir, Turkey'. Kafkas Univ. Vet. Fak. Derg. 18(6), pp. 1055-1060. Available at: https://doi.org/10.9775/kvfd.2012.7020

Jannah, A., *et al*. 2011) 'Isolation And Characteriza tion Of Gelatin From Chicken Bones Using The Acid Method', *ALCHEMY: Journal of Chemistry*. 2(3), pp.184-189. Available at: https://doi.org/10.18860/al.v0i0.2904

Putranto, HD., *et al*. (2021) 'Kelimpahan Relatif Ektoparasit Pada Inang Ayam Buras Lokal'. 2(1), pp. 1-8. Available at: https://doi.org/10.31186/bpt.2.1.1-8

Rama, A.K., *et al*. (2017) 'Infestation Pattern of Lice In Laying Ducks In Village of Kramat District of Bangkalan Region of Bangkalan'. *Journal of Parasite Science*. 1(2), pp. 51-54. Available at: https://doi.org/10.20473/jops.v1i2.16286

Rochmawati, E. (2018) *Duck Village Brand Image, Modopuro Village, Mojosari District, Mojokerto Regency*. Thesis. Fakultas Dakwah dan Komunikasi Universitas Islam Negeri Sunan Ampel Surabaya. Jawa Timur.

Selfiannisa, F., *et al*. (2018). 'Investation of Ectoparasites In Chickens In Village of Kramat District of Bangkalan Regency of Bangkalan'. *Journal of Parasite Science*. 2(2), pp. 57-60. Available at: https://doi.org/10.20473/jops.v2i2.16400

Sholihah, N. (2021) *Ectoparasite Detection in Cullin Layer Hen that Sold at Wonokromo Market Surabaya City*. Thesis. Fakultas Kedokteran Hewan Universitas Airlangga Surabaya. Jawa Timur.

Soulsby, E.J.L. (1986) *Helminth, Arthropods and Protozoa of Domestic Animals. Baillere Tindall and Cassel. London*.

Supriyanto, E.A., and Sitanggang, M. (2017). Hybrid Laying Duck. Indonesia: AgroMedia Pustaka.

Sutrisnawati. (2001) *Several Biological Aspects of Freshwater Gastropods and Their Potential as Intermediate Hosts for Trematode Worm Parasites in Humans in the Napu Valley Area, Central Sulawesi*. Thesis. Universitas Padjajaran. Bandung.

Tamiru, F., *et. Al*. (2014) 'Prevalence of Ectoparasite Infestation in Chicken in and Around Ambo Town, Ethiopia'. *Veterinary Science and Technology* 5(4)1, pp. 1-5. Avalaibale at: https://doi.org/10.4172/2157-7579.1000189

Taylor, M.A., R.L. Coop., and R.L. Wall. (2016) *Veterinary Parasitology. 4th. Ed. Willey Blackwell*.

Wall, R. and D. Shearer. (2001) *Veterinary Ectoparasites: Biology, Pathology*

Williams, E.H Jr and L.B. Williams. (1996) 'Parasites of Offshore Big Game Fishes of Puerto Rico and the Western Atlantic. Departement of Natural and Environmental Resources and University of Puerto Rico'. pp. 382 pages. Available at: https://doi.org/10.2307/3284483