



Seasonal infestation of donkeys by lice: Phenology, risk factors and management



L. Ellse^{a,*}, F.A. Burden^b, R. Wall^a

^a Veterinary Parasitology and Ecology Group, School of Biological Sciences, University of Bristol, UK

^b The Donkey Sanctuary, Sidmouth, Devon, UK

ARTICLE INFO

Article history:

Received 7 March 2014

Received in revised form 7 April 2014

Accepted 11 April 2014

Keywords:

Phthiraptera

Equine

Ectoparasites

Pediculosis

Donkeys

Bovicola

ABSTRACT

A longitudinal study was undertaken over a 21 months period to examine the seasonal abundance of lice infesting donkeys, the risk factors which predispose donkeys to infestation and the effectiveness of louse management. All the lice seen were *Bovicola* (*Wernneckiella*) *ocellatus*. A strong seasonal pattern, which was correlated with mean monthly temperature, was observed with higher prevalence and intensity in the cooler, winter months (October–March). Overall infestation in these animals was over-dispersed, suggesting that some individuals are strongly predisposed to infestation. Donkey age and mean hair length were characteristics which affected louse prevalence: older and younger donkeys and donkeys with longer hair harboured the highest numbers of lice. However, the practice of coat-clipping, to reduce the infestation, resulted in a lower louse prevalence only in the summer, suggesting that clipping is not an effective form of louse control in cooler months. Higher louse burdens were associated with larger areas of visible excoriation and hair damage, suggesting that *B. ocellatus* does adversely impact animal welfare. However, the ability of animal carers to estimate louse presence or absence accurately on an individual donkey was not sufficiently high to allow targeted selective treatment of heavily infested animals to be employed effectively. As animals are housed in closed herds these findings suggest that clipping in the summer and treating all animals with insecticide in late autumn, prior to turn-in may be an effective louse management strategy.

© 2014 Elsevier B.V. All rights reserved.

1. Introduction

Infestation by lice, known as pediculosis, can affect all large mammals and birds of domestic and agricultural importance. Heavy burdens of lice are associated with pruritus and excoriation which result in dermal lesions which can significantly reduce productivity, devalue hides and fleeces as well as posing a significant threat to

animal welfare (Heath et al., 1995; Wilkinson et al., 1982). These negative impacts are associated with both haematophagous sucking lice and scurf-feeding chewing lice.

Several factors influence the burden of lice, with a seasonal pattern of louse abundance often reported. In temperate climates, the burden of the sheep chewing louse, *Bovicola* in sheep and cattle is highest in the winter months (Craufurd-Benson, 1941; James, 1998; Murray and Gordon, 1969). Seasonal sampling of feral pony hides from equine abattoirs in south west England revealed a similar trend in *Bovicola equi* (Denny), with the highest prevalence of 60% of the hides sampled being infested in February (Gawler et al., 2005). However, in sheep kept in Perth, Australia this

* Corresponding author at: Veterinary Parasitology & Ecology Group, School of Biological Sciences, University of Bristol, Woodland Road, Bristol BS8 1UG, UK. Tel.: +44 1179287489; fax: +44 1173317985.

E-mail address: lauren.ellse@bristol.ac.uk (L. Ellse).

pattern was not observed, the burden of lice continued to increase throughout the austral summer months and only decreased after shearing (Wilkinson et al., 1982). Louse susceptibility and patterns of changing louse intensity have been attributed to climatic factors such as ambient temperature (Craufurd-Benson, 1941; James, 1998; Murray, 1968), rainfall (Murray, 1968) and solar radiation (Matthysse, 1946) as well as individual animal characteristics, such as breed and hair length (James, 1998; Wilkinson et al., 1982). Animal husbandry factors such as shearing/clipping (Allen and Dicke, 1952; Murray, 1968; Wilkinson et al., 1982) and housing (Wilkinson et al., 1982) have also been shown to affect louse populations.

Despite the ubiquity of lice, there have been very few longitudinal studies of natural louse infestations since the 1940s; most studies have been relatively short-term comparisons of louse prevalence and intensity, particularly in cattle and sheep. However, long-term studies are valuable because they allow a more detailed understanding of the factors which predispose individual animals to pediculosis and allow the effect of change in these factors over time to be identified. The aim of the work described in this paper, therefore, was to undertake a longitudinal study of louse infestation in four populations of donkeys over a period of 21 months. The lice infesting these animals had previously been shown to demonstrate high levels of pyrethroid tolerance (Ellse et al., 2012). This tolerance was thought to have developed through routinely repeated blanket treatment of all donkeys with pyrethroid formulations which did not adequately permeate the coat. The work described here aimed to identify risk factors associated with high infestation intensities which might contribute to the development of more effective louse management.

2. Materials and methods

2.1. Study populations

Four farms, with large, long-standing equine populations were used for the study. Each farm contained between 252 and 517 animals, the majority of which were donkeys although some ponies, mules and hinnies were also present. All animals were housed in groups typically containing between 20 and 120 animals. All animals at each farm carried a unique identification collar (as well as being micro-chipped). The farms were all located near Sidmouth in the UK; all were geographically separated and the transfer of animals between farms was infrequent. Prior to introduction onto a farm, animals were quarantined and treated for lice. Hence, louse infestation transfer between farms was minimal and the farms can be considered to be relatively independent populations.

The study was carried out over 21 months from May 2011 to January 2013. Each month, 24 animals were examined at each farm; only the donkey population was sampled. The sample size was estimated based on an expected 10% prevalence of pediculosis, detected with 90% confidence (Win Episcopo 2.0). These figures were conservative estimates, based on preliminary observations. Animals for examination were selected using a random number generator (Excel, 2007, Microsoft). Animals were

Table 1

Louse abundance scores used to quantify infestation by *Bovicola (Werneciella) ocellatus* on donkeys.

Abundance score	Observation
0	No lice seen in any of the five partings
1	<5 lice seen in all 5 the partings
2	5–10 lice seen in all 5 partings
3	>10 lice in all 5 partings

identified by their collars; when collars were missing a microchip scanner was used. During the course of the study, an outbreak of contagious disease resulted in the temporary unavailability of some of the farms, but at least one farm was visited and the animals examined every month throughout the 21 month study.

2.2. Louse abundance and excoriation

At each examination, a detailed data-capture sheet was used to record information about each animal. This included notes about each animal's conformation, husbandry, groom opinion, as well as the intensity of louse infestation and self-excoriation. Louse abundance was estimated at five body sites: the supraorbital fossa, behind the ear, on the side of the neck, in the axilla of the front leg and half-way along the midline. Preliminary studies had indicated that these were the infestation sites where lice were most likely to be found. In each area, the hair was parted five times in 5 cm lengths. The estimated abundance of lice in the five partings was assigned a score (Table 1). Each score was recorded separately for each body site. The abundance score for nymphs in each region was recorded separately from the score for adults, but the three nymphal instars were grouped together, as it was not possible to distinguish easily between nymphal stages by eye. Eggs were only recorded if they were found within the first 2 cm of hair, as lice position their eggs close to the skin of their host and therefore eggs near the tips of the hair follicle are likely to have hatched or be non-viable (Murray, 1957).

Donkeys were examined for visual indications of self-excoriation, consistent with hair disturbance and shortening of the hair fibre. The size of the rub area was recorded on animal line-diagrams. On each donkey, the sum of all rub patches was assigned an excoriation coverage score based on the size of the rubbed area(s) relative to the size of the donkey (Table 2).

2.3. Animal husbandry

At each infestation site the hair length was recorded to the nearest 2 mm (± 1 mm). The age of each individual animal was obtained from a database which contained clinical and husbandry details for every animal. Where the age was

Table 2

Excoriation coverage scores, defined by the area of a donkey that was showing signs of hair derangement or shortening of the hair fibre due to rubbing.

Percentage of the donkey covered by rub lesion	0	<10%	10–20%	>30%
Excoriation Coverage Score	0	1	2	3

Download English Version:

<https://daneshyari.com/en/article/5802902>

Download Persian Version:

<https://daneshyari.com/article/5802902>

[Daneshyari.com](https://daneshyari.com)