

Cross-sectional study of cattle lice infestation in the region of Nabeul in north-east Tunisia

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Summary

This cross-sectional study is the first to estimate the prevalence of cattle pediculosis in Tunisia. A total of 39 cattle farms in the region of Nabeul in north-east Tunisia were visited and lice were collected by intensively brushing 789 cattle. The prevalence was estimated to be 20.5% on the farms (8/39) and 4.7% in animals (37/789). Collected parasites were examined under a stereomicroscope and three lice species were identified: *Bovicola bovis*, *Linognathus vituli* and *Haematopinus eurysternus*. Thirty-two animals were infested with the chewing lice *B. bovis* (4%), three with *H. eurysternus* (0.4%) and two with *L. vituli* (0.2%). The infestation prevalence was higher in calves under eight months of age (21.6%) than in adults (0.8%). Decision makers in animal health should consider this parasitic disease in their control and eradication programmes.

Keywords

Cattle – Parasite – Pediculosis – Tunisia.

Introduction

Endemic parasitic diseases in developing countries are frequently neglected by farmers, field veterinarians and decision-makers in animal health. Since parasite infestation does not cause patent health problems it is not prioritised in the implementation of control programmes. Lice infestation is a good example of a problem which is not prioritised because the losses to farmers are perceived to be low. However, although the losses to individual farmers per day and per animal are low, when multiplying these small losses by the number of infested animals and by the various infestation rates, the high importance of neglected parasitic disease becomes apparent. Indeed, Byford *et al.* (1) estimated a 9.2% decrease in average daily weight gain as a result of pediculosis. Taking account of the reduction in milk yield and a decrease in the quality of leather, Drummond *et al.* (2) showed in 1961 that the annual losses due to pediculosis in the cattle industry in the United States reached US\$126.3 million. Despite the impact on cattle production, there have been few epidemiological studies on this parasite in developing countries. In these countries, animals are concomitantly challenged by several other diseases (tuberculosis, theileriosis, babesiosis, brucellosis, gastrointestinal helminthoses...), food resources are poor and farmers have limited financial resources and cannot support the cost of controlling animal diseases. In this context, losses due to lice infestation, even if low, could have a heavy impact on the financial equilibrium of farms. As far as is known, cattle pediculosis has never been studied in Tunisia. This report is a cross-sectional descriptive study of lice infestation in cattle farms in the region of Nabeul in north-east Tunisia.

Materials and methods

The study was carried out during the autumn (September to November) and winter (December to February) of 2011 in the region of Nabeul in north-east Tunisia. This region is located at 36°27' N, 10°44' E. The climate is Mediterranean, characterised by long periods of sunny days with mean temperatures ranging between 8.4°C and 15.8°C.

A total of 39 cattle farms were randomly included in the survey, which was carried out during an official mass vaccination campaign carried out by a field veterinarian. During the visits, the farmers were questioned about control measures against lice infestation. Cattle in small herds (fewer than 20 animals) graze in small pastures during the day and are housed at night; animals on large farms spend the day in paddocks and are housed at night. On rainy days, animals on both types of farm are housed.

All the cattle on the farms were examined under light for the presence of lice or nits. Parasites were harvested by intensively brushing the animals with a thin brush, using the modified technique of Lloyd *et al.* (3). The body of the animal was divided into 16 regions (eight on each side) of approximately 15×15 cm: head, withers, shoulders, dewlap, costal region, abdominal region, lumbar region and the base of the tail. The association of the parasites with different parts of the body was noted. Parasites were collected in tubes containing 70% v/v ethanol for species determination.

Epidemiological indicators were compared in chi-squared tests using Epi Info™ Version 6 software and a threshold *p* value of 0.05.

Results

Of the 39 farms visited, eight (20.5%) contained at least one infested animal. In total, the farms contained 789 cattle, among which 37 (4.7%) were infested by lice. Four farmers dipped animals with diazinon and none of those cattle were infested with lice. Four other farmers used ivermectin subcutaneously and two of these farms were infested by *Bovicola bovis*. The highest prevalence of infestation was recorded in Charolais and Brown Swiss cattle, whereas the prevalence in Holstein Friesians was very low ($p = 0.001$) (Fig. 1). During the survey, three species of lice were identified: *B. bovis*, *Haematopinus eurysternus* and *Linognathus vituli*. Of the 789 animals examined, 32 were infested with the chewing lice *B. bovis* (4%), three with *H. eurysternus* (0.4%) and two with *L. vituli* (0.2%). There was only one case, in a female calf, of co-infestation with *H. eurysternus* and *L. vituli* (0.1%). Pediculosis was more prevalent in calves under eight

months of age than in adult animals, at 21.6% and 0.8% respectively ($p < 0.001$) (Table I). The prevalence of infestation on farms and in animals was significantly higher during the winter (December to February) than in the autumn (September to November) ($p < 0.05$) (Table I).

Lice were found on six of the eight parts of the body examined (no lice were found on the abdominal or costal regions). *Bovicola bovis* was found over the whole body surface of the cattle, whereas *L. vituli* was found on anterior parts of the body (head, shoulders). *Haematopinus eurysternus* was present on the head and dewlap (Fig. 2).

Discussion

Despite the financial impact of cattle lice infestation in Tunisia, this is the first descriptive study of cattle pediculosis. The prevalence was estimated using a modified technique of Lloyd *et al.* (3), but the intensity of lice infestation was not estimated. Results showed that 20.5% of the farms were infested; however, this is probably an underestimation, since eight farms had used either ivermectin or diazinon at least once. No significant difference was found between large and small farms, possibly reflecting the small number of farms studied (Table I). Overall, 4.7% of the animals were infested with at least one species of louse. In Norway, Nafstad and Grønstøl (4) estimated the prevalence of cattle pediculosis as 42% in herds and 5% in the animals. Kakar *et al.* (5) in the Quetta region of Pakistan observed a much higher prevalence (38.3%) in cows but found only the chewing lice *B. bovis*. In the present study, the prevalence of *B. bovis* was roughly ten times lower (4%).

Lice were found to be more prevalent during winter (December to February, 55.5%) than autumn (September to November, 13.3%); this observation was also reported by Colwell *et al.* (6). The prevalence of pediculosis was also higher in male cattle than in females; this can be partly explained by the higher market value of the females, which receive more care than the males. In addition, the males are thought to

show a higher average daily weight gain if they are kept calm in darkened pens. The pens are never cleaned.

Louse infestation was more prevalent in calves than in adult cattle, and this has been reported by others (4). The difference in prevalence can be explained by the more efficient grooming behaviour in adults than in young animals. In the present study, *H. eurysternus* was found in calves, although Geden *et al.* (7) state that this species is mainly found in adult cattle.

Conclusion

The present study provides field veterinarians with valuable information and should result in greater attention being paid to risk categories (male calves during winter). The body distributions of different lice species are important for the screening and diagnosis of pediculosis in animals. It is also important to know whether topical insecticide is being used to control these parasites.

It is very difficult to estimate the financial impact of lice infestation in cattle. Because the lice do not cause patent health problems, farmers do not attribute high importance to them or to their control. Nevertheless, the losses persist for many months, so the total cost to farmers is high, and decision-makers in animal health should give more attention to the control of these minute parasites. Further studies are needed in other regions of Tunisia and in other livestock species to estimate the overall importance of pediculosis in Tunisia.

Competing interests

The authors have declared that no competing interests exist.

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Table I

Epidemiological features of pediculosis in cattle

A total of 789 cattle on 39 farms were examined for the presence of lice

Factor	Number (%)	<i>p</i> value
Farm size		>0.05
Fewer than 20 animals	5/31 (16.1%)	
20 animals or more	3/8	
Sex		<0.001
Female	17/623 (2.7%)	
Male	20/166 (12%)	
Age		<i>p</i> <0.001
Under 8 months of age	32/139 (21.6%)	
8 months of age or more	5/650 (0.8%)	
Season		
Farm prevalence		<0.001
Autumn (September to November)	4/30 (13.3%)	
Winter (December to February)	5/9	
Animal prevalence		<0.01
Autumn (September to November)	12/425 (2.8%)	
Winter (December to February)	25/364 (6.9%)	

Fig. 1
Prevalence of lice infestation in different breeds of cattle

Bars indicate standard error

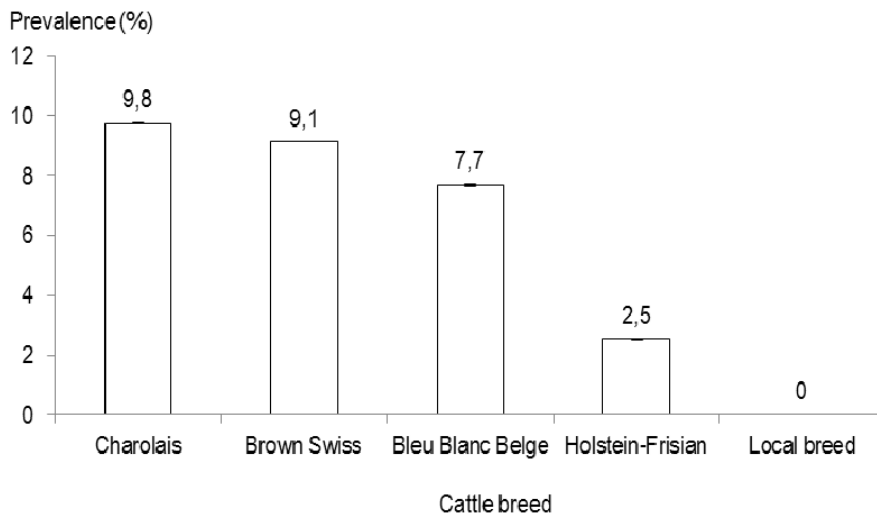


Fig. 2
Anatomical location of lice species

