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Occurrence of *Haematopinus apri* Gour. (*Anoplura*) on wild boar
Sus scrofa L. in Poland*

Występowanie *Haematopinus apri* Gour. (*Anoplura*) u dzika,
Sus scrofa L. w Polsce

Abstract

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The investigations on the occurrence of *Haematopinus apri* Gour. on *Sus scrofa* L. were carried out during certain years in all parts of Poland, between 1968 and 1972. *Haematopinus apri* was found to be a common parasite, occurring in all zoogeographical zones in Poland. The average incidence of infestation was moderate. Both the incidence and intensity of infection were inversely proportioned to the age of the host. They also underwent seasonal changes and reached the greatest values in autumn and winter. The foreknee folds were found to be an "indicatory location", as the parasites occurred in that body part during the whole year, the intensity being the highest.

The knowledge of the biology of ectoparasites occurring on the big game is insufficient. This concerns also *Anoplura*, resulting from certain difficulties in obtaining host individuals for study as well as from the fact that the methods of observation of living animals have not so far been elaborated.

A choice of *Haematopinus apri* as a subject of the present study was dictated by the rarity of the occurrence (Ferris 1951, Wegner 1966) and still controversial opinions on its distinctness in relation to *Haematopinus suis* L.

Haematopinus apri Gour. is reputed to be a typical, though a seldom parasite of *Sus scrofa* L. (Wegner 1966). In Europe, it was recorded in France (Ferris 1933), Belgium (Cooreman 1952), GDR, GFR (Zumpt 1942, Brütt 1955, Stubbe 1966), Poland (Gerwel 1954), Czechoslovakia (Smetana 1965), Hungary (Kohaut 1897, Dudich

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1927 after Piotrowski 1970) and Bulgaria (Touleshkov 1957 after Piotrowski 1970). On the wild boar also *H. suis* was found, among others in Switzerland, Austria, Tadzhikistan, United States of America and New Zealand.

Material and methods

The investigations were carried out from October 1968 to September 1972. During that period, 527 animals were examined; the age classes were defined according to Pielowski 1962. The material was collected in innumerable areas in the whole area of Poland, in order to gather the data representative for various natural conditions (Cf. the Map). The parasites were collected with two methods: (1) From dead animals at the stations of the Forest Production Enterprise "Las", some hours after hunting. The material was collected mostly by using this method. On the other hand, the wild boars obtained by hunting, immediately after shot were packed to the foil sacks containing a tampon impregnated with chloroform, and then the fur was precisely combed. These collections were made particularly carefully, for the material was destined to a quantitative research. This method, used with success in the work with rodents, was useful only in cases with wild boars of medium size; (2) lice collected from live animals anaesthetized by succinylcholine chloride injected intramuscularly at a dose of 0.6 mg/kg of body mass; the louse was established after Żurowski and Sakowicz 1965.

Results

Haematopinus apri Gour. was found on 184 out of 527 wild boars examined. The incidence of infestation was about 35%, the intensity reaching about 17 specimens per animal. These data refer to the occurrence of *H. apri* on wild boars (heterozygotic) with normal fur colour; such individuals prevail in the hunting grounds. In the populations of wild boars there occur sporadically "spotted hogs", bright with black patches. These individuals, homozygotic in respect of the colour, are of weaker condition than the heterozygotic ones and generally do not reproduce (Andrzejewski 1971). The intensity of infestation in these animals was two times as high as average and reached about 30 specimens *H. apri* per one infested animal.

The lice were found in over 60 localities of 17 provinces in Poland.

The degree of infestation was found to depend on the age of the host. Both incidence and intensity of infestation decreased with the age; in young wild boars it was about 54%, in adult animals — about 5% (Table I). In the group of sexually active animals the infestation on females was higher than on males. Particularly great number of lice occurred on gravid and nursing females. This can be explained by the fact that the sows and piglets live in groups in common lairs; it is known that certain hours are sufficient for lice to pass from one individual to another (Melnikova 1960). The low infestation on males results probably from a solitary



Map 1. The distribution of *Haematopinus apri* Gour. in Poland (the division of the territory of Poland, as proposed by the "Catalogue of the fauna of Poland", edited by the Zoological Institute, Polish Academy of Sciences): (1) Bałtyk (Baltic Sea); (2) Pobrzeże Bałtyku (Baltic Coast); (3) Pojezierze Pomorskie (Pomeranian Lakeland); (4) Pojezierze Mazurskie (Mazurian Lakeland); (5) Nizina Wielkopolsko-Kujawska (Wielkopolsko-Kujawska Lowland); (6) Nizina Mazowiecka (Mazowiecka Lowland); (7) Podlasie; (7a) Puszcza Białowieża (Białowieża Forest); (8) Śląsk Dolny (Lower Silesia); (8a) Wzgórza Trzebnickie (Trzebnickie Hills); (9) Śląsk Górny (Upper Silesia); (10) Wyżyna Krakowsko-Wieluńska (Krakowsko-Wieluńska Upland); (11) Wyżyna Małopolska (Małopolska Upland); (11a) Góry Świętokrzyskie (Świętokrzyskie Mountains); (12) Wyżyna Lubelska (Lubelska Upland); (13) Rostocze; (14) Nizina Sandomierska (Sandomierska Lowland); (15) Sudety Zachodnie (West Sudetes); (16) Sudety Wschodnie (East Sudetes); (17) Beskid Zachodni (West Beskids); (17a) Kotlina Nowotarska (Nowotarska Basin); (18) Beskid Wschodni (East Beskids); (19) Bieszczady (Bieszczady Mountains); (20) Pieniny (Pieniny Mountains); (21) Tatry (Tatra Mountains). The distribution of lice indicated by dots.

mode of their life as well as from the existence of "armour" in their body. It is 2–3 cm thick layer of weekly blood-supplied connective tissue, situated in lateral sides of the animal body (Alexandrowicz 1964), which

Table I

The occurrence of *Haematopinus apri* on wild boars and the host's age and sex

Host's age	No. of wild boars		Infestation	
	examined	infested	incidence	mean intensity on infested animals
Young wild boars (yearlings)	120	65	54	25 specimens
2nd year of life	279	92	33	11 specimens
3-5-year old sexually mature individuals	108	26	24	8 specimens (10 on females) (3.5 on males)
Old female and male individuals	20	1	5	below 1 specimens

diminishes the surface on which the lice can feed. Perhaps a negative influence on the number of lice is also exerted by an intensive odour of secretion of foreskin glands.

The changes in the degree of infestation during the year were also observed (Figs. 1-4). It was the highest in autumn and winter (50-72%). The intensity of infestation showed similar changes. Its maximum was recorded in October (29 specimens). The greatest number of lice (201 specimens) was found in December on one young wild boar, the minimum occurring in spring and summer (up to 4 specimens). This lowering on infestation seems to correspond with the loss of wooly and partly aristate hairs in spring; in summer, the coat of wild boars is poor. However, considering the relations between the incidence and intensity of infestation

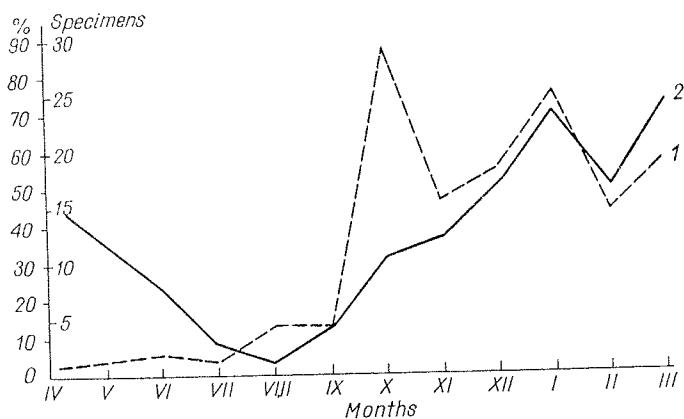


Fig. 1. The annual rhythm of the infestation of the wild boar with *Haematopinus apri* (including all the host age classes). Explanation: 1 — mean intensity of infestation; 2 — incidence (%) of infested cases.

in particular months it can be suggested that the increase of the incidence is not always correlated with the increase of intensity; in adult wild boars even the opposite relations may happen (Fig. 4).

The Table II shows that the changes in number of nymphs are fol-

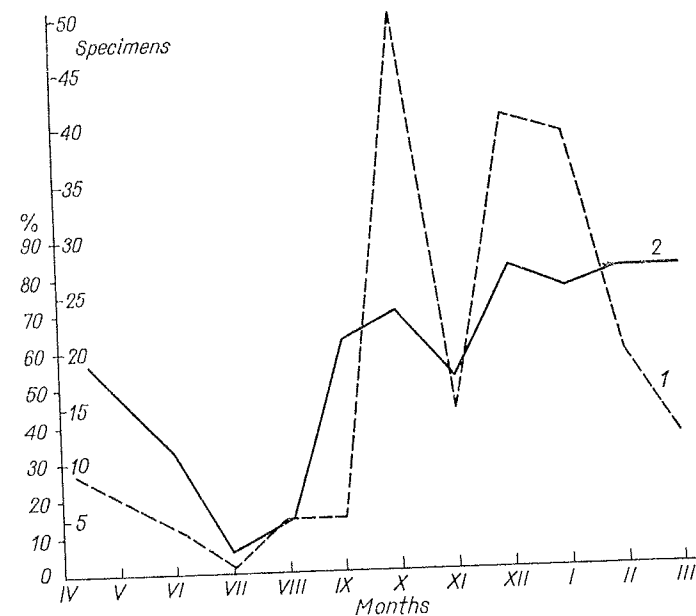


Fig. 2. The annual rhythm of the infestation of young wild boars (yearlings) with *Haematopinus apri*. For explanation cf. Fig. 1.

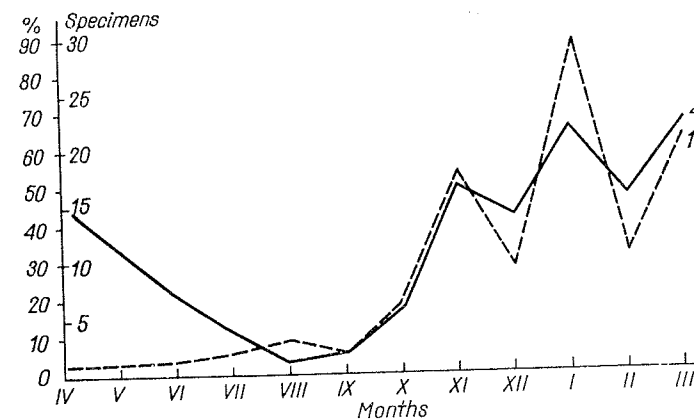


Fig. 3. The infestation of wild boars with *Haematopinus apri* in the second year of the host's life. For explanation cf. Fig. 1.

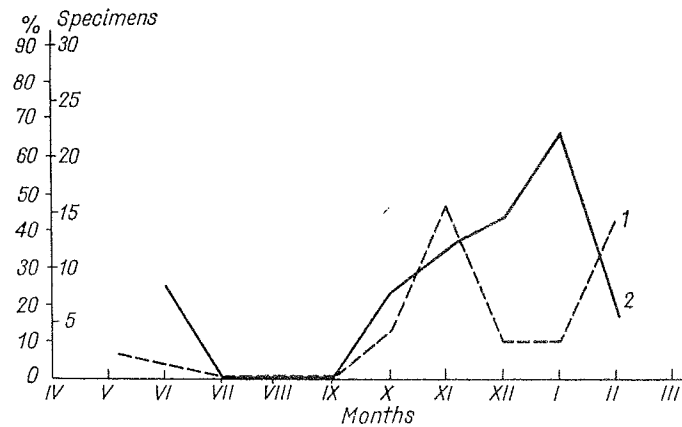


Fig. 4. The infestation of sexually mature wild boars with *Haematopinus apri*. For explanation cf. Fig. 1.

lowed by the changes in number of the whole population. In spring, there are no nymphs and only few females occur; in autumn the number of nymphs increases, what causes maximum of infestation. Simultaneously the proportion between sexes changes in disfavour of females, what could prognose a decrease of reproductive activity of the population.

Beside the seasonal changes also the long-term changes were observed. The data mentioned in the Table III show that only the incidence of infestation underwent the changes. The intensity remained on the same level. The highest intensity observed in 1970 was perhaps the result of a long winter. The snow-cap remained from October 1969 to April 1970. This fact caused a decrease of the condition in the game, and perhaps, increase of the incidence of infestation. On the contrary, soft winter 1971/1972 was followed by a distinct decrease of percentage of infested wild boars.

Table II

Seasonal changes in the structure of the *Haematopinus apri* population (materials collected on 12 wild boars from Kampinos National Park in 1968/1969)

Season	No. of lice					Total
	males	females	nymphs			
			III	II	I	
Spring (April-June)	0	2	0	0	0	2
Summer (July-September)	—	—	—	—	—	—
Autumn (October-December)	115	97	126	120	52	510
Winter (January-March)	52	41	36	34	25	188

Table III

Dynamics of *Haematopinus apri* infestation on wild boars in 1968-1972

Year	No. of wild boars		Infestation	
	examined	infested	incidence (%)	mean intensity on infested animals
1968 (Sept.-Dec.)	10	3	30	—
1969	69	27	39	13 specimens
1970	72	32	44	13 specimens
1971	248	87	35	12 specimens
1972	128	35	27	—

Distribution of *Haematopinus apri* on the host body

At an average level of infestation the greatest numbers of lice were found in foreknee folds ("foregroin") and on the chest. At a greater infestation the parasites occurred also in hindknee folds ("hindgroin"), on the lateral body sides of the body and in the area of the ears. The eggs were disposed mainly on the sternum and, at the great infestation, on

Table IV

The distribution of *Haematopinus apri* on the wild boar body (materials collected in winter on 15 young wild boars from Kampinos National Park)

Location	No. of animals infested with <i>H. apri</i>	No. of animals infested with <i>H. apri</i> eggs
Foregroins	15	6
Hindgroins	9	4
Eye regions	3	6
Body sides	5	1
Ear regions	3	1
Forelegs	1	1

lateral body sides, where they formed compact bands between fore- and hindgroins. At the low level of infestation, the foregroins and the chest were only body areas where *H. apri* occurred. Thus, these areas can be treated as "indicatory locations" of the occurrence of *Anoplura* on the wild boars (Table IV).

Conclusions and discussion

The distribution of *Haematopinus apri* Gour. in Europe corresponds in general line with the distribution of the wild boar. It was not recorded in Scandinavian Peninsula only, where on the 60° of the North

geographical latitude runs the northern limit of the wild boar distribution range (Brinck 1950, Mehl 1970). In Poland, this louse was found in almost all regions examined. This suggests that *H. apri* is fairly common, being a widely distributed parasite. Therefore the opinion on the rarity of this louse in Poland (Wegner 1966, 1972) should be rectified. Anyway, already Freund 1935 suggested, that this species would be recorded in Europe far frequently, if the observations were more detailed.

The percentage of infestation recorded in the present study (35%) is of moderate value; it is furthermore the average value for the entire country. The lower incidence of infestation was stated by Lavrovskij 1952 (after Melnikova 1960) in the Volga Delta (6.7%) and Henry and Conley 1970 in Appalachian Mountains (13.7%). A higher incidence of infestation was recorded by Ineson 1954 in New Zealand (68.1%) and Melnikova 1960 in Tadzhikistan (76%). These data are not fully comparable, because the mentioned authors carried out their investigations on much smaller territories than Poland is and on poorer material (for example Ineson examined 22 wild boars, and Melnikova — 165).

In the examined material, both the incidence and intensity of infestation were inversely proportioned to the age of the host; the infestation was highest on young animals (54%) and the lowest on old males and females (5%). It is worth considering whether the dependence between the infestation and the age of the host reflects an adaptation of the parasite to the existing power of food resources, for, as it is known, the young wild boars make about 60% of the flock number (Haber 1969).

Both the incidence and intensity of infestation underwent also the seasonal fluctuations; they reached the greatest value in autumn and winter. Similar changes in the number of lice on wild boars were observed by Melnikova 1960 in Tadzhikistan and by Henry and Conley 1970 in Appalachian Mountains.

The fluctuation of infestation were also noted during the whole period of investigations. The highest incidence of infestation (44%) was stated in 1970, what corresponded with the heavy winter. Most of the lice were collected from the fore- and hindknee folds and from the lateral sides of the body. In foreknee folds *H. apri* were found in all seasons and at the greatest numbers. Thus, these parts of the wild boar can be regarded as "indicator locations" of *Haematopinus apri* Gour. on *Sus scrofa* L.

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STRESZCZENIE

Badania były wykonane w okresie od października 1968 r. do września 1972 r. na terenie całej Polski. Autor zbadał łącznie 527 dzików. *Haematopinus apri* Gour. znalazł we wszystkich badanych krainach geograficznych Polski. Pozwoliło to stwierdzić, że wesz ta jest gatunkiem daleko bardziej pospolitym, niż należałoby się spodziewać na podstawie dostępnej literatury. W okresie badawczym odsetek zarażenia wynosił ok. 35%, co, zdaniem autora, jest wartością umiarkowaną. Ekstensywność i intensywność występowania wszy były odwrotnie proporcjonalne do wieku żywiciela, przy czym najsilniej opadnięte były warchlaki (54%).

Intensywność i ekstensywność ulegały także zmianom sezonowym; najwyższy stopień zarażenia i częstotliwości stwierdzany był jesienią i zimą. Wahania ekstensywności dały się zauważyć w całym okresie badawczym. Najwyższa ekstensywność wystąpiła w 1970 r. (44⁰/o).

Większość *H. apri* zbierana była w przednich fałdach kolanowych, gdzie wszy występowały przez cały rok i w największym nasileniu. Przednie fałdy kolanowe mogą być, zdaniem autora, uważane za „wskaźnikowe” okolice ciała w odniesieniu do występowania *Haematopinus apri* Gour. u dzika.