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THE BIRDS AND THE BEES

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ABSTRACT: In this essay attention is drawn to the ecological information which is provided by the remains of invertebrate animals found in an archaeological context. To illustrate this I present three examples in which the study of invertebrates can help to detect or identify the remains of birds, bird nests or bird droppings.

KEYWORDS: INVERTEBRATES, BIRDS, ARCHAEOZOOLOGY, PARASITES

RESUMEN: Este artículo trata de la información ecológica que se puede obtener de los restos de invertebrados hallados en un contexto arqueológico. Para ilustrarlo presentamos tres ejemplos en los cuales el estudio de invertebratos puede ser útil para evidenciar y, en su caso, identificar taxonómicamente no sólo los restos de pájaros sino también sus nidos y excrementos.

PALABRAS CLAVE: INVERTEBRADOS, PAJAROS, ARQUEOZOOLOGIA, PARASITOS

There exists a remarkable discrepancy in the animal kingdom between the number of species within each phylum and the number of archaeozoologists working on those groups (Figure 1). Our own taxonomic position as representatives of the vertebrate subphylum of the Chordata, together with the usual anthropocentric attitude of most scientists, are among the most logical explanations for this phenomenon. Obviously, some groups are also more difficult to use in archaeozoological interpretations because their remains have not been retrieved (yet) during excavations. However, I feel that the vast amount of ecological information that is to be derived from the invertebrates is still widely underestimated. Apart from the well established mollusc research, the interest in other groups such as beetles and other arthropods seems to be marginal at best. Recent research, on mites (Acari) by Schelvis (1992a), however, has shown that other groups of invertebrates may yield fascinating results when studied in detail.

As an example of the ways in which invertebrates can help to support traditional archaeozoological studies I will present three different methods of detecting the presence of avian remains on the basis of invertebrates.

1. Identification of nidicolous faunas characteristic of bird nests.

A specific relationship between birds and invertebrates is developed by the so called nidicolous invertebrate fauna, which consists of mite and insect species of specific occurrence in the nests of birds (and mammals). Bird nests are hardly ever recognised during archaeological excavations. The study of nidicolous invertebrates may thus help to detect and, in some cases, even identify, bird nests.

In the summer of 1990 an investigation took place on the 13th century building-history of the 'Calmershuis' in the town centre of Groningen in the North of the Netherlands. During this research

a large number of holes were detected in the 1.0-1.2 m-thick brick walls. These holes, the so called 'kortelingsgaten', were made during the construction of the wall in order to support the scaffolding on which the bricklayers were standing. The holes were closed from the inside of the wall but remained mostly open from the outside thereby producing ideal nesting places for birds. It is therefore not surprising that in several of these holes the remains of bird nests were found. Which birds were occupying these nests? One of the holes contained a substantial amount of nesting material as well as several egg-shell fragments and a nearly complete skeleton of a Swift (*Apus apus*) (Zeiler & Lommert, 1992). Whether this was indeed the nest of a Swift originally is doubtfull since the amount of nesting material seems far too big. However, Swifts are known to evict House Sparrows (*Passer domesticus*), Starlings (*Sturnus vulgaris*) etc. and use their nest-sites (Cramp, 1985). To solve this problem, it is obvious that we will need to study more than just the bones. An attempt will be made to identify the pieces of egg-shell (Siddell, this volume). Furthermore, the remains of the invertebrates found in the nesting material will be studied. Among the dipterous larvae, various beetles (Carabidae, Staphylinidae and Curculionidae), wood-lice, spiders and predatory mites found in this deposit could well be representatives of a nidicolous fauna characteristic of one of the above mentioned bird species.

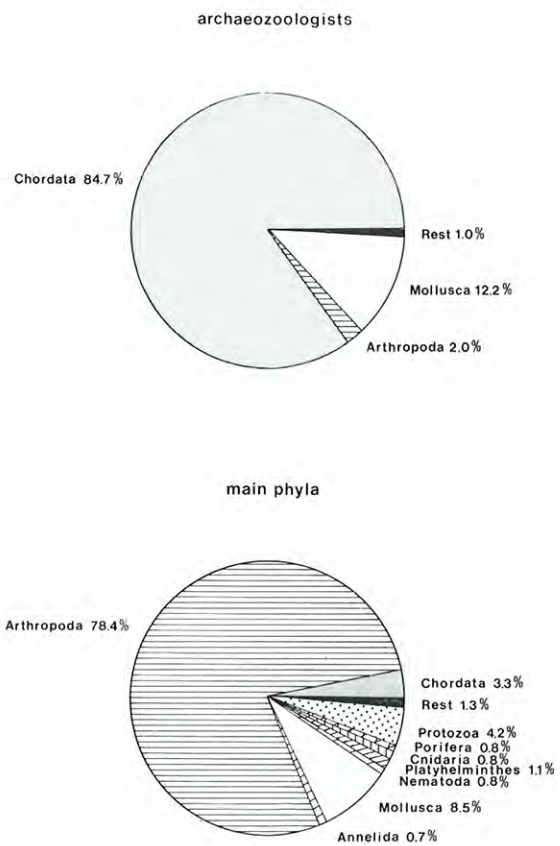

FIGURE 1 - The animal kingdom; top; Distribution of the relative number of archaeozoologists working on the phyla shown (based on information provided by the 1992-ICAZ-newsletter) and bottom; the relative number of species to be found in the main phyla (Barnes, 1980).

2.Identification of remains of specific avian ectoparasites.

Vertebrates invariably posess a number of more or less specific ectoparasites. Especially among the *Mallophaga*, the chewing lice occuring on birds, the degree of specificity is astonishing. Indeed, according to Kellogg's law, the taxonomic relationship between bird families can be judged by the degree of similarity of their lice faunas.

During the 1990 excavation of the Wolters-Noordhoff-complex in Groningen, a number of remarkably well preserved feathers were found in a 13th century dung deposit (Figure 2).

The feathers belonged to either a Rook (*Corvus frugilegus*) or a Crow (*Corvus corone*). Meticulous investigation of the feathers revealed the presence of the remains of a featherlouse (*Mallophaga*) and of feathermites (*Analgesidae*). Unfortunately, the state of conservation of the lice remains did not allow an identification to species level. If this had been possible, the identification could have provided an answer to the question on whether these feathers came from a Rook or from a Crow (Zeiler & Schelvis, 1991).

FIGURE 2 - Two of the 13th century tail feathers of a Rook or a Crow which were found to contain the remains of ectoparasites (left) and a detail of one of the feathers (right).

3.Establishing the presence of specific invertebrate inhabitants of avian excrements.

Mesostigmatic predatory mites (*Gamasida*) characteristically occur in habitats rich in decaying organic matter. One of these habitats is formed by the excrements of (domestic) animals. It has been shown (Schelvis, 1992a) that most of these coprophylous mites occur predominantly in the dung or droppings of one particular domestic animal species. By identifying the remains of these predatory mites, it is possible to detect the presence and to identify the accumulating agent(s) of archaeological dung deposits including poultry droppings.

A sample of 1 kg was taken in 1982 during an excavation in the town centre of Leeuwarden, also located in the North of the Netherlands. The occupation level was dated to the 12th century A.D. (De Langen, 1992). On top of the 153 remains of oribatid mites, which were used for an environmental reconstruction, this sample yielded six species of predatory mites. According to Schelvis (1992b) half of these species (*Androlaelaps casalis, Uroobovella pyriformis* and *Trichouropoda orbicularis*) can be considered dung-indicating species (Figure 3). Finally, two individuals of the poultry-indicating species *Trichouropoda ovalis* were found. Therefore, the conclusion is that this medieval sample did include poultry droppings.

The results of the identification of dung deposits can be combined with those from traditional archaeozoological studies. By combined analysis of both the bone remains and series of dung samples found in a settlement, it will be possible to distinguish between animal species which were actually reared at the site from those whose remains ended up there either through trade or hunting.

The overall conclusion of this paper therefore, is that the study of invertebrate remains can provide useful ecological information on the presence and/or identity of birds, bird nests and bird droppings.

FIGURE 3 - The 12th century remains of a male *Trichouropoda orbicularis*, a dung indicating predatory mite species (length: 750 mm).

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