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What do Bohemian Waxwings *Bombycilla garrulus* find on agricultural fields in winter?

Vad hittar sidensvansar Bombycilla garrulus *på åkerfält vintertid?*

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Abstract

We describe three cases when Bohemian Waxwings *Bombycilla garrulus* behaved as if they were searching for food on the ground in frozen fields in the winter. Inspection of the sites where they searched revealed little or no available food items. In one case the droppings contained juniper seeds but these must have been consumed elsewhere as there were no junipers at the site. Drinking water may have been the explanation in one case where upwelling water flowed over the ice. We speculate that eating minerals is another possible explanation, but leave the question open.

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Introduction

During the breeding season, insects taken in the air are an important, but probably over-estimated, food source for Bohemian Waxwing *Bombycilla garrulus* (Witmer 1996, del Hoyo et al. 2005). Outside the breeding season, their diet is dominated by berries and fruits (e.g. from Rowan *Sorbus aucuparia*, Aronia *Aronia arbutifolia* and Apple *Malus pumila*) and large flocks can be seen around these food sources in urban and rural environments. Throughout the year, Bohemian Waxwings spend most of their non-flying time perched on trees, shrubs, buildings and other structures.

Occasionally, we have observed flocks of Bohemian Waxwing on agricultural fields, e.g. >120 near Degernäs on 6 December 2015 and four individuals near Överboda on 28 December 2015, both in Umeå municipality, Sweden. In the latter case, the birds repeatedly landed on a sparsely stocked grassland for short spells, frequently interspaced by perching on nearby trees. Also in case of the former, the birds appeared to be reluctant to stay on the ground and wave after wave flew up only to return seconds or minutes later. Here the peat-rich soil was largely barren and the surface had recently been affected by frost heaving caused by vertical ice pinnacles formed by intermittent freezing of moist soil. After observing the behaviour of the birds for c. 20 minutes we searched the field for clues to explain their behaviour. The dark soil surface was still largely frozen. To the naked eye, there were no insects and only small numbers of seeds from weeds. The birds had left no tracks and no droppings were noticed. Nevertheless, from their behaviour it was obvious that they were searching and occasionally took something from the surface, while walking around rather frantically.

On New Year’s Eve 2016, four Bohemian Waxwing flew off and soon returned to a part of an agricultural field in Hössjö, Umeå. Like earlier observations, the birds were on the ground only for very short periods of time. At closer range, it became clear that the birds focused on an approximately 20×50 m sized patch of ice, formed by overflowing water from a clogged water-logged ditch. The whole ice-sheet had formed over the last few days and, despite below-freezing ambient temperatures, small amounts of water were still flowing across the surface. Parts of the ice and the water flowing on top of it were rusty-brown from iron-colloids. Across the whole ice-sheet, only a few straws of vegetation emerged through the ice, so there was

Bohemian Waxwing Sidensvans. Photo: Lars Edenius.

virtually no plant matter available as a food source, which effectively excluded herbivory. Searching for invertebrates, again with the naked eye only, resulted in a few specimen of spiders *Araneae*, beetles *Coleoptera* and flies *Diptera* (probably Winter Crane Flies *Trichoceridae*). Locally slightly higher densities of tiny springtails *Collembola* occurred. Even by waxwing standards, this was probably a poor and easily depleted serving.

Nevertheless, on the surface of the ice there were numerous droppings of birds; some on top of it, but the majority partly embedded into the ice. Obviously, these droppings had been deposited after the last snowfall a few days earlier. Given the low densities of small passerine birds in the open parts of this winter landscape, there were few candidate bird species who could have produced these droppings. In addition, their size, shape and colour were clearly different from "normal" droppings of tits or sparrows. The freshness of some of the droppings also pointed at a nearby producer. These factors combined give us strong reason to believe that these were Bohemian Waxwing droppings. We managed to collect c. 40 droppings and intended to get back later for photo-documentation. Unfortunately, early darkness and the onset of snowing prevented this.

Figure 1. Seed of *Juniperus communis* found in droppings of Bohemian Waxwing. In wet conditions the husk of the seed has a shine to it. Length c. 4.5 mm.
Frö av en påträffat i spillning från sidensvans.

Figure 2. Head capsule of the *Boreus westwoodi* (Hagen 1866) found in one of the collected droppings of Bohemian Waxwing. The head is c. 1.8 mm long, including the maxillary palps.
Huvud av Boreus westwoodi *påträffat i spillning från sidensvans.*

Almost all the droppings were very dark and c. 2×5 mm in size. They were packed with glossy, blackish "shales", superficially reminding of the external chitin skeletons of insects. At closer examinations under an 8–35 times magnification microscope, almost all proved to be fruits and seeds from Juniper *Juniperus communis* cones (Figure 1). The glossy shales noted in the field were the husks of the Juniper seeds which have a shine to them when wet. Juniper bush is absent from the open farmland area where the ice-field was located, but not uncommon in the nearby forest (closest distance c. 450 m).

Apart from the Juniper parts, only the remains of two invertebrates were found in the droppings. One head of a cold-tolerant, wingless species of the genus *Boreus (Boreidae*, Snow Flies) and one elytron of a Rove Beetle (*Staphylinidae*). In Sweden, two species of *Boreus* occur, *B. westwoodi* and *B. hyemalis*, both found on snow during the winter months (Tjeder 1951). Most likely, the head capsule belonged to the more common species *B. westwoodi* (Hagen 1866). This species has a metallic microsculpture on the forehead (Figure 2), which is a diagnostic character to differentiate these two species.

Then what was the reason for the Bohemian Waxwing to land repeatedly on a wet ice-sheet out on an open field? Feeding on plant matter can be ruled out, there wasn't any. Feeding on invertebrates was not very likely either, because invertebrate numbers were low. Instead, the Bohemian Waxwings may have been there to drink from the water flowing over the ice. Due to low moisture content in their winter food, Bohemian Waxwing are known to drink often (del Hoyo et al. 2005). Neither the precise places where the birds were observed nor the positions of their droppings suggested a strong association with the miniature streams on the ice. To a human observer, there were better drinking places nearby in the landscape, but all of those were either concealed by vegetation or below ground-level in ditches and streams. Maybe Bohemian Waxwings require good visibility when on the ground, an unfamiliar environment for them. Their reluctance to

settle on the ground has been reported by Dana Anderson (1948) from Nebraska, USA, where Cedar Waxwing *Bombycilla cedrorum* were on the ground drinking from pools while Bohemian Waxwing from the same flock stayed in the trees.

In addition to water, the Bohemian Waxwing may have been in search of the colloidal soil chemicals made available by the upwelling water. Like parrots and crossbills, Waxwing are likely to need detoxifying chemicals to handle metabolically challenging chemical compounds in their food (Woldemeskel & Styer 2010). Both Rowan berries and Juniper cones are rich in secondary compounds, e.g. phenolics (including tannins) and glycoalkaloids (Cipollini & Levey 1997a, Cipollini & Levey 1997b, Mikulic-Petkovsek et al. 2012). Tropical parrots cure themselves by eating special clays (e.g. kaolin, Gilardi et al. 1999), and crossbills have been reported to eat soil (Latta 2012) and mortar from buildings (A. de Jong, personal observation); all examples of geophagy. We have been unable to find references on Bohemian Waxwing feeding on potentially detoxifying materials (but see: de Jong 2003). However, a suspected case of road salt poisoning (Töpfer 2010) could indicate geophagy also in this species.

The bottom line: The quest for the true reason why Bohemian Waxwing visit agricultural fields in winter is still open. The authors welcome reports of similar sightings as well as relevant literature references.

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Sammanfattning

Vid några tillfällen har vi sett sidensvansar vistas på jordbruksmark vintertid. Tre fall redovisas här. I det första fallet, med fyra individer, gjorde vi ingen närmare inspektion av platsen utan noterade bara att de betedde sig som om de sökte föda på marken. I det andra fallet, med 120 individer, noterade vi samma sak och studerade fåglarnas beteende i tjugo minuter. Vi inspekterade sedan platsen noga. Trots att fåglarna uppvisade ett intensivt födosöksbeteende och då och då faktiskt också plockade upp något fann vi inte några insekter utan bara enstaka små ogräsfrön; någon spillning sågs inte heller. I det tredje fallet var det fyra fåglar som uppehöll sig inom ett område på 20 gånger 50 meter med vattenöversilad is på en åker. Här fanns spillning och vi samlade in ungefär fyrtio stycken. Analys under mikroskop visade att spillningarna, som var mycket mörka, var packade med fröskal från en (Figur 1). I övrigt hittade vi bara rester av två insekter, en kortvinge och en snöslända. Intaget av enfrön kan dock inte ha skett på platsen eftersom det är 450 meter till närmaste enbuske.

Eftersom vi i det tredje fallet endast hittade små mängder möjlig föda var födosök antagligen inte fåglarnas främsta sysselsättning. Möjligen drack de av vattnet som rann på isfältet eller så var de ute efter mineraler som fläckvis färgade vattnet brunt. Att äta jord o.d. för att få i sig mineraler är känt från flera olika fågelarter. Men frågan om varför sidensvansar kan ses på skenbart födosök på åkrar får lämnas öppen. Vi efterlyser observationer av liknande slag eller tips om litteratur som beskriver fenomenet.