

## Summary

A Lapwing *Vanellus vanellus* nest with three eggs was found on a forest clear-cut in southwest Sweden. I have found no previous records of Lapwings breeding in this habitat. Many other farmland specialists in Sweden occur also on clear-cuts, and maybe is the Lapwing the next species to colonize this typical forest habitat.

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## Food-storing of slime mould in Siberian Jay *Perisoreus infaustus* during the post-breeding season

*Hamstring av slemsvamp hos lavskrika Perisoreus infaustus efter häckningssäsongen*

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On July 8, 2008 a pair of Siberian Jays *Perisoreus infaustus* was observed at Björnlandet National Park, which lies in southernmost Swedish Lapland. The observation took place about one km to the north of the lake Angsjön in late afternoon (17–17:30h local time). Both birds were recorded to store food items from the bright yellow plasmodium of a slime mould (video clip showing the birds' behaviour can be viewed at [http://www.fotobiota.com/video\\_inUK.php?spec=53&clip=143](http://www.fotobiota.com/video_inUK.php?spec=53&clip=143)). One by one, sometimes together, the jays were coming repeatedly to the moist and heavily decayed trunk lying on the ground and supporting the slime mould, filling their sublingual pouches with mould and then fixing the food items on neighbouring trees (Figure 1). The hoarded items (food boli) had the size of a chewing gum (about 2 cm long) and were fixed in concealed places, in most cases among hanging lichens (*Usnea* sp.) on side branches. The food boli were stored on trees (mostly Norway spruce *Picea abies* and birch *Betula*, but also Scots pine *Pinus sylvestris*) within a radius of 10–15 m from the mould. The nearest three stored items were fixed 2–5 m away (mean 3 m), at 1.9–4.05 m above the ground (mean 3.15 m) and on Norway spruce (2.9 m high) and birches (7 and 9 m). It is evident that

food items were fixed at roughly the mid-height of trees – the above-mentioned three at about 45–65.5% (mean 53.5%) of total tree height.

Before starting storing the food, both Siberian Jays were observed to chase away persistently 1–2 Redwings *Turdus iliacus*. It remains unclear whether the jays were provoked because of the fact that Redwings found the slime mould first or just because of their presence in the jays' territory.

The marked tendency in Siberian Jays to store food is well known (Cramp & Perrins 1994). This type of behaviour occurs mainly in spring, autumn and winter (Blomgren 1971, Andreev 1982, Pravosudov 1984), very rarely in summer. Most of the young are already fledged by the end of May or in early June, and a month later they usually feed independently (Cramp & Perrins 1994). Hence, the observed behaviour of food storing in July could be regarded either as supporting the young birds still inhabiting the territory or as a beginning of the intensive food storing in autumn or even as quick utilization of large but perishable food resource.

As an adaptation for living in the boreal regions in winter the Siberian Jay, as well as its close relative the Grey Jay *Perisoreus canadensis*, have sublingual salivary glands producing saliva, which is used to form food balls and to make them stick to hiding places (Bock 1961, Dow 1965, Andreev 1982, Pravosudov 1984). In contrast to the cold season, in spring the food is carried in bill and not treated with saliva (Pravosudov 1984). In our case the food boli were completely permeated by and coated with saliva, otherwise the extremely soft and fragile plasmodium of the slime mould could not be stored as well-formed food items.

In the past, the slime moulds were treated taxonomically as part of the fungi but currently they fall in another kingdom that includes the protozoans (Cavalier-Smith 2003). Although fungi ("true fungi") have been recorded in the diet of the Siberian Jay (Novikov 1952, Vorobiev 1963, Andreev 1982), no references dedicated on feeding of this bird species on slime moulds were found. However, the Gray Jay has once been reported "feeding on a large yellow plasmodium of the slime mold *Fuligo septica* in the Northern Cascades of Washington" (Sutherland & Crawford 1979). Data on the relationships between birds and slime moulds are extremely limited. It was shown that a number of ground-feeding passerine species of birds serve as distribution vectors of slime moulds (Suthers 1985).

The contribution of the present observation is towards the (1) unusual time of the year when food-



Figure 1. Siberian Jay collecting and caching slime mould. Top: One of the Jays on the decaying trunk with the slime mould. Above: Close-up of the slime mould. Left: A food bolus treated with saliva and cached in a tree.

*Lavskrika som samlar och gömmer slemsvamp. Upp till: En av lavskrikorna på den murknande stammen vid slemsvampen. Ovan: Närbild av slemsvampen. Till vänster: Ett paket av slemsvamp som bearbetats med saliv och gömts upp i ett träd.*

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storage in Siberian Jay took place (mid-summer) and (2) unusual food used for bolus to be stored (slime mould).

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### References

- Andreev, A.V. 1982. Winter ecology of the Siberian Jay and the Nutcracker in the region of Northeast Siberia. *Ornithologia* 17: 72–82. [in Russian]
- Blomgren, A. 1971. Studies of less familiar birds. 162. Siberian Jay. *British Birds* 64: 25–28.
- Bock, W.J. 1961. Salivary glands in the Gray Jays (*Perisoreus*). *Auk* 78: 355–365.
- Cavalier-Smith, T. 2003. Protist phylogeny and the high-level classification of Protozoa. *European Journal of Protistology* 39: 338–348.
- Cramp, S. & Perrins, C.M. 1994. *Handbook of the Birds of Europe, the Middle East and North Africa*. Vol. 8, *Crows to Finches*. Oxford University Press, Oxford.
- Dow, D.D. 1965. The role of saliva in food storage by the Gray Jay. *Auk* 82(2): 139–154.
- Novikov, G.A. 1952. Data on the feeding of forest species birds on Kola Peninsula. *Trudy Zool. Inst. Akad. Nauk SSSR* 9: 1155–1198. [in Russian]
- Pravosudov, V.V. 1984. The storage of food by the Siberian Jay (*Perisoreus infaustus*, Passeriformes, Corvidae) in spring. *Zool. Zhurnal* 63, 6: 950–953. [in Russian]
- Sutherland, J. B. & Crawford, R. L. 1979. Gray Jay feeding on slime mold. *The Murrelet* 60: 28.
- Suthers, H.B. 1985. Ground-feeding migratory songbirds as cellular slime mold distribution vectors. *Oecologia* 65: 526–530.
- Vorobiev, K.A. 1963. *The Birds of Yakutiya*. Moscow, RAN Publ. House. [in Russian]

### Sammanfattning

På eftermiddagen den 8 juli 2008 påträffade vi ett par lavskrikor nära Angsjön i Björnlandets natio-

nalpark i södra Lappland. Båda fåglarna hamstrade bitar av en lysande gul slemsvamp som växte på en starkt förmultnad stock som låg på marken (Figur 1). Fåglarnas beteende kan ses på en kort video: ([http://www.fotobiota.com/video\\_inUK.php?spec=53&clip=143](http://www.fotobiota.com/video_inUK.php?spec=53&clip=143)). En och en eller båda tillsammans kom de gång på gång till stocken med slemsvampen och fyllde sina tungpåsar. Dessa bearbetades med hjälp av saliv till ungefär två centimeter långa paket som hängdes upp på dolda ställen i närliggande träd (gran, björk, tall). Lavskrikans hamstringsvanor är välkända, de hamstrar vanligen under vår, höst och vinter, mycket sällan på sommaren. De flesta ungar är flygga i slutet av maj eller början av juni och en månad senare skaffar de föda på egen hand. Trots detta kan det observerade beteendet kanske tolkas som att fåglarna stödutfodrade sina ungfåglar. Men kanske var det en tidig yttring av begynnande hösthamstring eller helt enkelt ett sätt att rädda en tillfällig och snabbt försvinnande födokälla. För hamstringen på hösten använder lavskrikan normalt saliv för att tillverka födobollar som kan fästas på olika gömställen. På våren sker normalt ingen sådan hamstring. De slemsvampsbollar som våra lavskrikor gjorde var dock helt indränkta av saliv, vilket var en nödvändig förutsättning för att de skulle hålla ihop och kunna fästas i trädens grenar.

Detta är första observationen av lavskrikor som samlat plasmodium av en slemsvamp, men fenomenet har en gång tidigare observerats hos den nära släktingen gråskrika *Perisoreus canadensis* i nordvästra USA.

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