

Flight Behaviour of Passerines on Nocturnal Migration

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Abstract

Many passerines migrate during the night and at high altitudes, making their migration difficult to observe. By using tracking radars we have been able to make exact observations of the flight behaviour of passerines on nocturnal migration, which has enabled us to test several hypotheses about adaptive values and constraints regarding migratory behaviour in different ecological contexts.

We have investigated the birds' flight speeds and we were able to see that birds consistently fly faster in spring than in autumn. This could be due to optimality reasons, as there might be a higher selection pressure to arrive early at the breeding grounds in spring than at wintering grounds in autumn. We have also investigated the timing of nocturnal migration by exploring how it is affected by midnight sun conditions in the Arctic, and can show that the pattern of nocturnal migration persists even in those conditions.

At a site in southernmost Sweden, Falsterbo peninsula, we tested the hypothesis that coastlines affect the flight direction of migrants, and saw no evidence of small scale coastline effects. In Falsterbo we also had the unique opportunity to combine our radar data with data from a radio telemetry system on the peninsula and the longstanding ringing regime in the area. By combining methods we could see that the departure directions and directions during climbing flight differed from the directions of birds in level flight. This suggests that migrating birds adjust their orientation once aloft.

We also used our combined methods to investigate what separates birds flying in reverse directions from birds continuing forward on migration. Bird flying in reverse directions flew slower, at lower altitudes and later in the night. They were also leaner and younger than birds continuing forward. All animals that fly must deal with winds, which can have a very large positive or negative effect on the flight conditions. In two comparative studies we show that nocturnally migrating moths and passerines achieve similar ground speeds and flight directions by using contrasting responses to winds.